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ABSTRACT

This document, which is designed to prepare teachers and administrators to integrate vocational and academic education successfully, contains 46 case studies illustrating the roles teachers must assume to facilitate such integration. The cases, which have been drawn from a 1992 study titled "Teachers' Roles in the Integration of Vocational and Academic Education" (B. June Schmidt et al.), are grouped by four functional themes: cooperative efforts; curriculum strategies; instructional strategies; and administrative practices and procedures. Also included are an introductory discussion of the importance of integrating vocational and academic education, a list of purposes the cases can serve, and guidelines for selecting appropriate cases and managing the instructional setting. The following are among the titles of the case studies included: "Teachers Teaching Students"; "Coordination Gone Awry"; "The Applied Approach Makes All the Difference"; "Sharing with Parents"; "Teaming to Develop a Textbook"; "Hands-On Experience Versus Class Attendance"; "Making Math More Relevant"; "The Student Does the Teaching"; "Letter Writing in the Auto Mechanics Lab"; "The Community Can Be a Valuable Resource"; "Dealing with the Skeptics"; "Team Teaching"; and "Organizing for Teacher Cooperation." Appended are a 12-item bibliography and a chart detailing the type of school(s), teaching areas, and cooperative efforts illustrated in each case study. (MN)

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PREPARING TEACHERS TO SUCCESSFULLY INTEGRATE VOCATIONAL AND ACADEMIC EDUCATION: A CASE STUDY APPROACH

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PREPARING TEACHERS TO SUCCESSFULLY INTEGRATE VOCATIONAL AND ACADEMIC EDUCATION:
A CASE STUDY APPROACH

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EXECUTIVE SUMMARY

The 46 cases provided in this publication focus on developing effective vocational and academic education integration strategies. An instructor using the cases can search for examples of successful integration strategies, and inversely, the absence of such strategies in a variety of instructional and school settings. Case study use in education and other fields has revealed that students enjoy cases and, in the process of using them, appear to improve their problem-solving and decision-making skills. In addition, these cases set the stage for team building, a component essential in the implementation of vocational and academic education integration.

The cases are based on recent research completed for the National Center for Research in Vocational Education on teachers' roles in the integration of vocational and academic education. Through the use of interview procedures, the study documented experiences of vocational and academic teachers, principals, other administrators, and counselors who had successfully implemented the integration in their schools. In developing the cases, actual names and locations have not been used and the situations have been adapted as needed to present basic concepts and concerns related to the integration.

The cases are organized into four functional themes: (1) Cooperative Efforts, (2) Curriculum Strategies, (3) Instructional Strategies, and (4) Administrative Practices and Procedures. The themes emerged from experiences described by the individuals interviewed. The first three themes represent stages of development teachers experience as they implement the integration. The Administrative Practices and Procedures theme provides examples of administrative actions that impact the teacher efforts both positively and negatively.

By field testing the case studies in a variety of workshop and classroom settings, with both prospective and practicing educators, insight was gained into how the cases may be used most effectively. More than a dozen different instructors and more than four hundred participants used the cases. From their input, suggestions are provided for understanding purposes the cases can serve, selecting appropriate cases, and managing the instructional setting.

A Chart of Cases is provided. For each case, the chart contains the title, type of school setting, teaching areas included, and a brief description. The chart is particularly useful in gaining an overview of the cases and in selecting cases that relate to particular needs. The cases are valuable in programs for graduate students, prospective teachers, and practicing professionals. The basic guideline for use of the cases is that they be employed to enhance and improve educational practice.

7

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TABLE OF CONTENTS

Executive Summary i
Acknowledgments iii
An Introduction to the Case Studies 1
Using the Case Studies 5
References 11
Group I - Cooperative Efforts 13
    Case Study 1 - Let's Get Started 15
    Case Study 2 - Teachers Teaching Teachers: Can It Work? 18
    Case Study 3 - Don't Step On My Toes 21
    Case Study 4 - Commitment Makes the Difference 24
    Case Study 5 - The Importance of Terminology 27
    Case Study 6 - Different Courses, Different Students, Different Teaching 29
    Case Study 7 - Shifting from "Us and Them" to "We" 31
    Case Study 8 - Coordination Gone Awry 33
    Case Study 9 - The Applied Approach Makes All the Difference 35
    Case Study 10- Sharing with Parents 37
    Case Study 11- Teacher Cooperation Leads to Learning Enrichment 40
    Case Study 12- Reinforcing Academics 43
Group II - Curriculum Strategies 45
    Case Study 13 - The Turning Point 47
    Case Study 14 - Confusion Reigns 49
    Case Study 15 - Was It Miscommunication or Inexperience? 51
    Case Study 16 - Teaming To Develop a Textbook 53
    Case Study 17 - Hands-On Experience Versus Class Attendance 55
    Case Study 18 - Should They Pull Them Out? 57
    Case Study 19 - Making Math More Relevant 59
    Case Study 20 - Time for Change 61
    Case Study 21 - Building a Better Mouse Trap (Car) 63
    Case Study 22 - The Business of Learning 66
    Case Study 23 - Getting Back on Track 68
Group III - Instructional Strategies 71
    Case Study 24 - The Student Does the Teaching 73
    Case Study 25 - But, It Takes Time 75

Case Study 26 - The Formula for Interest 77
Case Study 27 - Letter Writing in the Auto Mechanics Lab 79
Case Study 28 - Mathematics in the Pre-Engineering Laboratory 82
Case Study 29 - The Community Can Be a Valuable Resource.................. 84
Case Study 30 - Diabetics in the Classroom.. 86
Case Study 31 - Interviewing Skills.. 88
Case Study 32 - Teaching Writing Skills to Horticulture Students 90
Case Study 33 - A Science Teacher Learns about Computers.................... 92
Case Study 34 - Anxiety in the Computer Laboratory 94
Case Study 35 - Don't Say Trigonometry 96
Case Study 36 - Parasites in the Fish Tanks 98
Group IV - Administrative Practices and Procedures 101
Case Study 37 - What We Have Here Is a Communication Problem 103
Case Study 38 - If at First You Don't Succeed 105
Case Study 39 - Dealing with the Skeptics 107
Case Study 40 - Promises Never Kept.. 109
Case Study 41 - Team Teaching: What Made It All Possible 111
Case Study 42 - When Are They Really Going To Involve the Faculty? 114
Case Study 43 - This Will Ruin Our School! 117
Case Study 44 - Organizing for Teacher Cooperation............................. 119
Case Study 45 - Is There a Leader in the House?................................. 121
Case Study 46 - A Heart-to-Heart Talk 124
Appendix A: Selected Bibliography for Case Study Instructional Method............. 127
Appendix B: Chart of Cases 131

AN INTRODUCTION TO THE CASE STUDIES

Faculty associated with professional preparation programs such as business and law frequently use case studies with their students to bridge the gap between foundational studies and practice. In addition, case studies are now used more and more often in the preparation of teachers and educational administrators. Assessments of case study use in education and other fields have revealed that students enjoy cases and, in the process, appear to improve their problem-solving and decision-making skills.

This series of 46 cases is designed to help teachers assume roles needed to facilitate the integration of vocational and academic education. The cases are drawn from a recent study on *Teachers' Roles in the Integration of Vocational and Academic Education* completed in 1992 by Schmidt, Finch, and Faulkner for the National Center for Research in Vocational Education. The study documented experiences of vocational and academic teachers, principals, other administrators, and counselors who had successfully implemented the integration in their schools. In developing the cases, actual names and locations have not been used. Further, consideration is given to the contexts within which situations or events took place and the types of questions that might assist in stimulating classroom or workshop discussion. These questions are provided at the end of each case.

The cases are organized into four functional themes: (1) Cooperative Efforts, (2) Curriculum Strategies, (3) Instructional Strategies, and (4) Administrative Practices and Procedures. Based on an analysis of experiences described by the individuals interviewed, the themes serve to bring together cases that share common stages of integration. The first three themes represent stages of development teachers experience as they implement the integration. The Administrative Practices and Procedures theme provides examples of administrative actions that impact the teacher efforts both positively and negatively. The publication *Creating Research-Based Case Studies to Assist Teachers with Academic and Vocational Education Integration* (Finch, Schmidt, Moore, & Perry, 1995) provides details regarding development and field testing of the cases.

The cases are useful in programs for prospective teachers and administrators and in professional development seminars and workshops for practicing professionals. The basic guideline for use of the cases is that they be employed to enhance and improve educational practice.

Integrating Vocational and Academic Education

To benefit from using the cases, prospective and practicing educators need an understanding of why the movement to integrate vocational and academic education surfaced and what purpose it serves. Vocational and academic education addresses three current educational concerns: (1) economic necessity, (2) efficiency of learning, and (3) social justice. It brings together in a logical and effective way instruction that students receive from both their vocational and their academic teachers. Through integration, instruction is interrelated to unify learning attained in subjects typically taught in isolation.

The workplace is clearly changing, with employers needing workers who have a much broader range of skills than in the past. Workers will need technical skills, academic proficiency, and the ability to solve problems, to work as team members, and to communicate effectively with a variety of people in a workplace settings. Instruction that integrates vocational and academic subjects and classes can help students develop these skills.

It should be recognized that education does not focus solely on workplace needs. Education includes two distinctive and yet interrelated goals: (1) education for life and (2) education for earning a living: "Dealing with these two broad goals as separate entities is sometimes quite difficult, if not impossible. Each must be considered in light of the other" (Finch & Crunkilton, 1993, p. 8). Thus, education for life might include studies focusing on areas such as mathematics, science, and communication. Even though these studies can help equip a student to be a responsible citizen, they may also contribute to satisfying employers' needs for employees that have greater facility in mathematics, science, and communication. Education for earning a living, which might include studies focusing on areas such as functioning as a member of a worker team, getting along with other workers, and developing and presenting a technical report in an employment context might also prepare a person to develop and present reports in non-employment contexts.

Cognitive scientists have studied the processes by which people acquire both occupational and academic skills. They have concluded that students are better able to transfer problem-solving skills to out-of-school settings when theory is taught in context. Students require exposure to the use of problem-solving skills in contexts they will face in real-life situations. Teachers who integrate vocational and academic education can provide students with these experiences.

The delivery of vocational and academic learning to all students further supports the need to integrate vocational and academic education. Generally, high schools have three tracks: (1) college-bound, (2) vocational, and (3) general. The goal of the college-bound track is to help students attain a high level of academic achievement. Additionally, some vocational programs prepare students for advanced technological occupations that require a high level of basic academic proficiency. Other vocational programs, however, have not challenged students academically. Further, many students have opted to complete high school by pursuing low-level general track and unrelated vocational courses. These students are neither prepared for work nor for further education.

To address the concerns of economic necessity, efficiency of learning, and social justice, educators have implemented a number of different strategies for integrating vocational and academic education. These case studies explore ways that vocational and academic teachers have worked together to meet the two broad goals of integration, which are presented in the publication *Integrating Academic and Vocational Education Guidelines for Secondary School Principals* (Schmidt, Beeken, & Jennings, 1992). They are as follows:

1. To provide all students with the occupational, academic, and higher-order skills needed to function effectively in a technologically advanced society, a globally competitive marketplace, and an information-based economy.
2. To enhance students' learning through the use of findings of cognitive psychologists including focusing on students, not on content; teaching academic and problem-solving skills so that they are mutually reinforcing; encouraging students to recognize and solve problems; and reinforcing academic skills with hands-on applications.

Prior to using the cases, a more extensive review of the concepts of integrating vocational and academic education than presented here may be needed. Group discussion or individual study and reflection can generate a broad-based understanding of the characteristics of integration. The study on *Teachers Roles in the Integration of Vocational and Academic Education*, previously mentioned, may be used to stimulate discussion. Other publications prepared by authors of the cases that may also be useful for the purpose of reviewing vocational and academic integration include *Integrating Academic and Vocational Education Guidelines for Secondary School Principals*, the source of the goals noted above; *Using Professional Development To Facilitate Vocational and Academic Integration: A Practitioners Guide* (Finch, Schmidt, & Faulkner, 1992); *Collaborative Efforts Between Vocational and Academic Teachers: Strategies that Facilitate and Hinder the Efforts* (Schmidt, 1990); and *Helping Teachers to Understand Their Roles in Integrating Vocational and Academic Education: A Practitioners Guide* (Schmidt, Finch, & Faulkner, 1992).

The Case Studies

Through the 46 cases, the user can select examples of successful integration of vocational and academic education demonstrated by the behaviors of key players, and inversely, the absence of effective integration strategies. Questions may be raised such as why would certain strategies or the absence of those strategies be central to a certain case study? Such is the nature of probing that can be undertaken in case study analysis.

Instructors selecting case studies to augment a related course may choose those cases for discussion and role play that best exemplify the thematic concepts covered earlier in the class or those scheduled to be covered concurrently with the case studies. On the other hand, instructors who are planning to use the cases as a complete course for credit or as an inservice professional development seminar will probably select as many cases to analyze as time permits. Based on experience users had when field testing the cases, a section for this publication on "Using the Case Studies" has been prepared. It provides insight into purposes the cases can serve, selection of cases, and managing the instructional setting.

Finally, understanding the purpose of case studies as a learning tool for developing effective vocational and academic education integration strategies is important. Those who are not seasoned case-method group leader/facilitators may wish to review in advance some of the resources listed in the selected bibliography provided in Appendix A. Such a review will no doubt enhance users' knowledge and self-confidence as they prepare for what the authors feel will be an enormously rewarding and exciting learning adventure.

USING THE CASE STUDIES

By the field testing of the case studies in a variety of workshop and classroom settings, with both practicing and prospective educators, we have gained insight into how the cases may be used most effectively. The suggestions that follow are based on input from more than a dozen different instructors and more than four hundred participants who used the cases. Suggestions focus on understanding purposes the cases can serve, selecting appropriate cases, and managing the instructional setting.

Purposes the Cases Can Serve

Case studies provide a teaching tool that allows learners to build on shared experiences. Further, they are effective as a catalyst that can promote change, particularly among practicing educators.

1. The cases can help prospective teachers learn how experienced teachers react to situations that require them to change. Also, prospective teachers may gain insight into roles they will fulfill when implementing the integration.
2. The cases promote a setting where the discussion of sensitive issues can take place. In addition, they facilitate exploring what might be.
3. The cases are particularly useful as "ice breakers" and in stimulating nonthreatening discussions when the integration of vocational and academic education is first being examined. Cases help individuals using them realize that others face challenges similar to their own.
4. The cases demonstrate how teachers have actually implemented a variety of integration activities in different settings along with some outcomes of their efforts. Thus, they can help stimulate teachers' interest in moving toward the integration.
5. Team building is an important part of implementing the integration. The case studies set the stage for team development by providing the incentive for participants to discuss and share personal experiences related to those that teachers described in the cases have had.
6. The cases can help teachers with actual implementation of the integration activities by providing details of real-world experiences others have had. For example, cases

can stimulate vocational and academic teachers to form a committee, identify team teaching opportunities, or develop a curriculum project that aligns their teaching areas.

Selecting Appropriate Cases

Selecting appropriate cases for use with particular groups of practicing or prospective educators is critical to using them successfully. In Appendix B, a "Chart of Cases" is provided. For each case, it contains the title, type of school setting, teaching areas included, and a brief description. Some things to consider in selecting cases follow:

1. Select cases from the various theme areas giving consideration to the stages of development participants are experiencing or will experience. Briefly, the following are the three major stages of growth teachers experience in the integration process:

   Stage 1: Cooperative Efforts when the teachers learn about each other to find a basis for mutual support, share information about students and instruction, and then begin to coordinate details of planning and instruction. (Group I cases, Numbers 1 through 12, focus on this stage.)

   Stage 2. Curriculum Strategies when teachers meet to plan initial projects and activities, change from past procedures to fit their instruction to their new plans, and work together to design aligned, enhanced curriculum. (Group II cases, Numbers 13 through 23, focus on this stage.)

   Stage 3. Instructional Strategies when teachers initiate integrated instruction they have planned. In this stage, they emphasize learning through the applied approach, teach cooperatively through jointly developed assignments and units, and use community resources to support their instruction. (Group III cases, Numbers 24-36, focus on this stage.)

   Group IV cases, Numbers 37 through 46, focus on the theme of **Administrative Practices and Procedures** that impact the teachers efforts to achieve the integration of vocational and academic education.

2. Avoid selecting cases from only one of the four theme areas. The content of cases within a theme area may overlap and accompanying discussion questions may seem

repetitive. A variety of cases are provided in each theme area so instructors can select cases that mirror instructional situations and settings that the case study users have had or will experience.

3. Select cases that provide examples of both vocational and academic teachers meeting with success and encountering difficulties. In some cases, academic teachers resist change; in others, the vocational teachers resist change.

4. Select cases that include types of teachers and settings that are as similar as possible to the ones of the intended users. Users relate best to the cases that focus on actual problems they are likely to face.

5. The importance of using hands-on, contextual learning is emphasized in many of the cases. Select cases with this emphasis if helping teachers change to this type of instruction is an important consideration.

6. Remember that individuals using the cases have different background experiences and will react to the cases in different ways. Thus, select cases that illustrate a variety of integration experiences.

Managing the Instructional Setting

Much of the success of using the cases depends on careful management of the instructional setting. The following are a number of suggestions that can help the instructor assure that maximum benefit is derived from discussion of the cases:

1. Without background knowledge of what the integration of vocational and academic education is and what purpose it serves, case users will not be able to relate to the integration concepts emphasized in the cases. Thus, before assigning any of the cases to prospective users, be sure they have this background knowledge.

2. Provide copies and assign reading of the cases the day before they are to be discussed in class. Individuals read and grasp information from reading at varying rates. Providing an opportunity for all users to read the cases ahead of time facilitates use of instructional time and avoids embarrassing those who need more time than others for reading the cases.

3. Form groups of individuals with different background experiences to discuss the cases. The groups might be comprised of vocational and academic teachers, guidance counselors, and administrators. Further, they may be from the same or different schools. Also, vary individuals who make up the discussion groups from case to case.

4. For the first case discussed, have all groups work with the same case and compare answers to the discussion questions. For subsequent cases, assign a number of cases to be read (3 to 5), and have different groups select specific cases they will discuss. They can then present outcomes of their discussion to the total group.

5. Establish procedures for the groups to follow when discussing the cases. They should designate someone to present the case, someone to record highlights of their discussion, and someone to report these highlights to other participants.

6. Encourage the groups to add details to the cases from their own experiences. Further, they may want to develop a role play situation or skit to present the case to other participants. Bringing the cases to life helps emphasize the integration concepts they focus on.

7. Not all discussion questions that follow a case need to be answered. Select questions that illustrate points you want to emphasize. Another approach would be to disregard the discussion questions and instead use an "Identify the problem, create a solution" approach. Doing this will encourage participant involvement.

8. Emphasize that teachers are neither "good" nor "bad" as they work toward implementing the integration. Stress that it is a process that requires change which is sometimes resisted.

9. Have the case study users write down key points they observed from the cases before discussing them with others. In this way, no one's thoughts or concerns will be ignored.

10. Allow adequate time for discussion of the cases. Time needed for group discussion of each case will take 15 to 20 minutes. Then allow 15 to 20 minutes for presentation of the case and discussion about it with all participants.

11. Be nonjudgmental when reacting to responses to the discussion questions. It is entirely possible for the groups to explore avenues of discussion you had not previously thought of. Avoid supplying answers to the questions you feel have not been fully answered; instead, use a counseling type approach of reiterating responses until participants provide responses of more depth.

12. Emphasize the importance of participants discussing and finding solutions that will work in their own particular teaching situations. Many of the problems that arise in the cases are the result of poor communications. Ask why the breakdown in communications occurred and what can be done to remedy it.

The preceding suggestions summarize input received to date from users of the cases. As the cases are used in other settings and possibly for different purposes, other considerations important in their use will no doubt emerge. Instructors using the cases are, thus, encouraged to add what they learn to these suggestions. In that way the effectiveness of the cases will continue to increase as they are used with new groups.

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Group I

Cooperative Efforts

Cooperative efforts consist of collaboration between teachers related to the integration of vocational and academic education that does not specifically focus on curriculum or instruction. Cooperative efforts emphasize (1) knowing, or learning about one another as a basis of mutual support; (2) helping each other by sharing information about students and instruction; and (3) coordinating planning and instruction.

Case Study 1
Let's Get Started

Jane Wong came to Bakersfield High School as the new principal six years ago. Bakersfield has operated as a comprehensive high school where students are tracked into one of three curriculums: academic, general, and vocational. The academic students prepare for college, while the vocational students prepare for work. Unfortunately, the students in the general track are neither prepared for college nor for work. For the past three years, the central office administrators, particularly the vocational coordinator, Elsworth Haman, have been talking with Jane about implementing a change that focuses on the integration of vocational and academic education. One of the major purposes of the change is to eliminate the general curriculum and to provide all students with the opportunity to prepare for work as well as for further education. Jane has always been careful not to make quick decisions. She needed to get a sense of how the teachers at Bakersfield High would react before advocating the integration initiative.

After Jane discussed various integration strategies with a number of teachers and received their reactions, she decided to appoint a committee of five teachers to start to work on integrating the ninth grade curriculum. The committee members were to design a project that could be implemented among the English and vocational teachers. In anticipation of eliminating the general curriculum, the project was to focus on some sort of career exploration activity. Talking with Elsworth Haman, Jane noted that "I deliberately, as a calculated risk, selected one vocational teacher who was positive toward the idea of integration and one who was negative. The situation was the same with the English teachers; one was positive toward integration and the other was negative." Jane also decided that the librarian, who was neutral toward the idea of integration, should be appointed to the committee.

Jane sensed that Ross Rotouski, the negative vocational teacher, felt the whole idea was a bunch of nonsense. Ross thought that he should teach only technical skills in his building construction classes. Jack Bates, the positive vocational teacher, however, asked Ross if his students didn't use math, science, and writing skills in his class as well as later on the job. Ross had to agree that they did and eventually he started to support the integration project the committee was designing.

Elizabeth Johnson, the negative English teacher, also seemed to resent the idea of changing the assignments she had typically used with her students. In discussing her classes, she has often noted to other teachers that she focuses on teaching abstract thinking skills and that the writing assignments she uses are highly effective in developing these skills. They involve interpreting classical literature and she feels they are particularly worthwhile for the college-bound students.

After several meetings, the committee members decided that the ninth grade career exploration project would require students to develop research and interviewing skills and culminate with them preparing written reports and presenting the reports orally in their English classes. The students would need to work extensively in the library to develop their projects. Jane had hoped that the project would evolve in this way. That is why she appointed the librarian to be on the committee. The English teachers and the librarian would spearhead the library research phase of the project. The vocational teachers would spearhead the phase that involved the students interviewing people in the business community so they could learn firsthand about requirements for different occupations. In grading the projects, the vocational teachers would evaluate them for accuracy of content while the English teachers would grade them for quality of both written and oral presentation skills.

As the committee members worked through the details of the project, they became more and more committed to it. The positive teachers kept emphasizing that the purpose of the project was to help students develop skills they would really need throughout their lives. The two negative teachers, Ross and Elizabeth, seemed to develop enthusiasm for the integration effort. When details of the project were complete, the committee members, in turn, discussed with their colleagues in the English and vocational education departments the merits of it and on working together. Although consensus was reached on the project, the trust level between the two groups of teachers was still precarious. The teachers realized that they would need to monitor the project as it was implemented and revise it along the way.

Discussion Questions

1. Jane Wong, the principal, appointed the committee. Would it have been better to have teachers volunteer or be nominated by their colleagues? Why or why not?

2. What educational outcomes should the committee focus on?

3. What strategies might Jane use to help Ross and Elizabeth develop a feeling of commitment to the integration project?

4. If you were Jane, what strategies would you use to improve the collaboration efforts of the academic and vocational teachers in designing the integration project?

5. In this case study, Ross and Elizabeth gave reasons for feeling negative toward the integration project. What other reasons might they have to feel negative toward integrating vocational and academic education?

6. How could the career exploration project help set the stage for eliminating the general curriculum at Bakersfield High School?

7. Should integration activities start at the ninth grade level as Jane perceived, or can they just as well start at the eleventh and twelfth grade levels? Why or why not?

8. What can Jane do to ensure the project continues beyond one year?

Case Study 2

Teachers Teaching Teachers: Can It Work?

As the school year drew to a close last spring, the teachers at Wilhollow High School learned that some funds would be available for two teachers to attend a regional conference the second week of July on the integration of vocational and academic education. During the year, the teachers at Wilhollow had given some effort to emphasizing basic academic skills in all classes as an initial attempt at integration. They learned that this was one of the first stages of integration, called the infusion approach.

Ten teachers were interested in attending the conference and applied for the funds. The two selected to attend were Kevin Bradenberg, a business teacher, and Santanya Murphee, an English teacher. Both had been at Wilhollow for a number of years and were well-respected by other faculty. Part of the reason they were selected is that the two had already jointly developed a project that involved giving students a common assignment across their classes. The assignment included report preparation, word processing, and graphic presentation of information.

Before the regional meeting took place, Kevin and Santanya learned that they would participate in a special workshop at the conference on reading- and writing-in-the-content-area. While traveling to the meeting, they talked at length about how important technical reading and writing skills had been for their students to complete the reports assigned between their classes. They also discussed how they wanted to improve the projects next year so that they would be even more closely aligned with the on-the-job expectations their students would soon encounter. Kevin and Santanya were anxious to learn strategies they could use to help their students improve their technical reading and writing skills.

The workshop actually turned out to be better than Kevin and Santanya expected. In fact, they learned a number of down-to-earth strategies for helping students improve their work-related reading and writing skills. As an outcome of the workshop, they developed several new projects for students from their two classes to complete.

When they enthusiastically told their principal, Jack Kilgannon, about what they had learned, he suggested that they provide an inservice session for other teachers at the high school. Thus, all teachers at the high school could benefit from their attending the regional conference. Preparing for the inservice day proved quite time consuming, but both teachers were so convinced that what they had learned was of value to all teachers that they were more than willing to give the time needed. As the inservice day progressed, the other teachers at Wilhollow High School quickly grasped how they could use the reading- and writing-in-the-content-area strategies that Kevin and Santanya presented. Before the day was over, a number of the teachers had begun to discuss cooperative projects that could be carried out between their classes.

When the principal saw how effective the inservice session had been for the Wilhollow High School faculty, he suggested that Kevin and Santanya provide a similar inservice session for teachers from the Wilhollow Technical Center. Many students at Wilhollow High School attend the technical center, located five miles away, for their half-day occupational programs. The long-range goal for integrating vocational and academic education included involving teachers from both the high school and the technical center. Mr. Kilgannon saw the session that Kevin and Santanya had prepared as an initial step in getting members of the two faculty groups to cooperate with one another.

Teachers from the high school and the technical center had little, if any, contact with one another. However, two occupational teachers from the technical center, the welding teacher and the cosmetology teacher, had also attended the regional conference. They participated in sessions on integrating mathematics into the vocational curriculum. At the conference, the four teachers became friends and often ate their meals together. They could not help but comment on how strange it was that they had to attend a regional conference to get to know one another.

Since Kevin and Santanya were already friends with the two teachers from the technical center and had already prepared the materials needed for the inservice session, they did not hesitate in agreeing to provide the session for the technical center faculty. The day that they arrived to provide the session, they immediately sensed a feeling of hostility on the part of a number of the technical center teachers. The teachers noted that the examples Kevin and Santanya used did not relate to the materials their students read. Further, they said that students did very little writing in their classes. By the end of the day, Kevin and Santanya as well as the teachers at the technical center were all frustrated.

Later, when talking about the experience they had at the technical center with their principal, Kevin and Santanya began exploring why the inservice session had not been the success it had been at the high school. They knew from what they had learned at the regional conference that for the integration of vocational and academic education to occur at an effective level all faculty would have to cooperate. They were disappointed that the faculty at the technical center did not hold the same view.

Discussion Questions

1. What are some possible reasons why the inservice session that Kevin and Santanya provided was not favorably received by the technical center faculty?

2. To what extent is giving more emphasis to basic skills in classes an effective way to integrate vocational and academic education?

3. What should teachers know about one another and what others teach before they try to help one another?

4. What characteristics should inservice sessions have to be directly related to what teachers actually encounter in their classes?

5. To what extent is reading- and writing-in-the-content area a good place to start when developing activities that are integrated across classes? Are there other places to start?

6. How could Mr. Kilgannon have helped Kevin and Santanya avoid the hostility from the technical center faculty that they encountered?

Case Study 3
Don't Step On My Toes

The first faculty meeting for the new school year was underway at the Salem City magnet school for technical occupations—the Future Horizons Career Center. Not much new was occurring, when suddenly everyone perked up hearing the principal, Ellen Fazio, announce she had written a proposal to the State Department of Education that had been funded. The purpose of the funded project was to enhance the curriculum and it had been approved contingent on the Center faculty being able to carry it out.

Since the school first opened some 15 years ago, the Future Horizons faculty had prided themselves in student preparation. Students who completed programs at the school had gained the technical skills needed for a variety of employment opportunities in the city, including transportation, building construction, electronics, business, and marketing occupations. Students attend Future Horizons full-time in grades 10 through 12, receiving both vocational and academic instruction.

The faculty, who had arranged themselves at the faculty meeting in their typical pattern of vocational teachers on one side of the room and academic teachers on the other, were delighted to hear the principal's good news. They quickly started talking with colleagues seated next to them about how they would like to use the funds. The vocational teachers focused on equipment they needed; while the academic teachers focused on resource materials and computers they needed.

Then Ellen started to describe what use of the funds would involve. The teachers were to form teams of vocational and academic teachers to align curriculum so that students' communication skills would be improved. The math and science teachers inadvertently gave a sigh of relief. Even though they wouldn't get the extra funds, at least they wouldn't have to be involved in rewriting their curriculums and changing their instruction. Many of the vocational teachers did likewise, thinking that little would be required of them since communication skills were hardly the focus of their instruction; they concentrated on teaching technical skills.

As Ellen continued to explain the curriculum development task that would be done, the teachers soon realized they would all have to work together, focusing on developing both the written and verbal communication skills of the students. Ellen told the group she had written the proposal based on input from the school's advisory committee. One of the advisory committee's big topics for the past year had been the changing nature of jobs in the city. New jobs as well as those already in place were changing, requiring workers to communicate much more extensively than in the past. A report from the advisory committee had been prepared with the help of Ellen and two vocational teachers who served on the committee, Joe Wyzinsky and Marilyn Boyle.

The teachers, Ellen noted, would have to develop projects that the students completed across all their classes. All teachers would be involved. The vocational teachers looked across the room at the academic teachers and the academic teachers looked across the room at the vocational teachers. Each was thinking, "You are not going to step on my toes, you are not going to start changing what is in my territory." Joe and Marilyn did not realize that the advisory committee report would impact their classes.

As the meeting was drawing to a close, the principal asked the teachers to form teams. Of course, some of the teachers were more receptive than others to accepting the new challenge. Most of the teachers formed teams with other teachers they knew and felt comfortable with. A few who did not buy into the idea of changing what they were doing were assigned to teams by the principal. Many of the teachers not wanting change ended up on teams together. Ellen asked that by the next faculty meeting each team present some suggested ways that curriculum could be aligned between vocational and academic courses as required for use of the funds. She then distributed to each faculty member a copy of the proposal she had prepared.

At the faculty meeting three weeks later, some of the teams sat together while others kept to their old habits, with vocational teachers on the left and academic teachers on the right side of the room. A variety of comments could be heard throughout the room. For example, Judy Condor, an electronics teacher, noted to those around her, "If this plan for integration began before classes started, my blood pressure wouldn't be so high." Jim Arbaugh, an English teacher was heard saying, "This is not working; the vocational teachers don't see any need to change and I don't either." Margaret Sajac, a business teacher, commented, "Students need these communication skills before they come to my classes." And Zelinda Juarez, a home economics teacher noted, "I am already doing this—I always have."

When it was time for the committee reports on what changes might be feasible to help align the curriculums, the teachers mostly gave reasons as to why they shouldn't change. One of the committees even reported that they did not see how they could conduct a project that they had not designed.

Discussion Questions

1. What is occurring in the workplace that caused the Center's advisory committee to focus on the need for workers with better communication skills?
2. Should vocational teachers focus on technical skills first, then give attention to other skills such as communication skills only as time allows? Give reasons why some teachers might favor this approach. Also, give reasons why some teachers would not favor it.
3. Why did so many teachers react negatively to the integration projects?
4. What are some ways that vocational and academic teachers can get to know one another and what others teach?
5. What suggestions can be provided to vocational and academic teachers to help them get started with the task of integrating their curriculums and their instruction?
6. Why would some vocational and academic teachers welcome this change while others might resist it?
7. How could the teacher teams have been formed so that they would have been more functional?
8. What are some "lessons learned" from this case study?

Case Study 4

Commitment Makes the Difference

Smithfield City has two large high schools, each with an adjacent technical center. For the past two years, language arts and vocational faculty at the two high schools and the two technical centers have been working together to implement various strategies for integrating vocational and academic education. This year, the Smithfield City school administrators have decided to grant special fellowships for teacher teams to attend a regional workshop on integration. The workshop, which is sponsored by North Fork State University is designed for math, science, and vocational teacher teams.

Four individuals applied for the workshop fellowships. Two were from the city's Bayside High School: Joyce Morris, an innovative physics teacher, and Walt Axelrod, a mathematics teacher who specializes in showing his students hands-on applications of math principles. Two were from the Bayside Technical Center: Genivive DeAngeles, the electronics teacher, and Walter Vaughan, the principal. The team members were all excited when they learned they received the fellowships, with the science and math teachers being especially pleased because they had been feeling left out of the ongoing integration activities at Bayside High. They were glad that Genivive was part of the team as her students consistently won recognition for outstanding performance in Vocational Industrial Clubs of America competitive events at the regional and state levels. Further, several had even won at the national level.

After the first three days of the workshop, Walter Vaughan began to wonder how in the world his team was going to face up to all of the extra work required of the teachers. Participants attending the workshop from five other high schools across the state were already complaining about the extra time needed to plan for integration activities. The workshop leaders decided to give the group the afternoon off so they could get together as teams and discuss how they were going to approach the integration process.

When the teachers from Bayside sat down together, Genivive, the electronics teacher, mentioned problems she had in teaching Ohms Law, which involves both math and science. All at once the three teachers started brainstorming about how they were going to approach integration. Within an hour, the three teachers had roughed out nine weeks worth of integration activities involving science, mathematics, and electronics applications. The science and math teachers were planning to take theory into application so they could reinforce the hands-on skills needed in electronics. As the afternoon progressed, the three teachers developed a matrix showing how concepts for math, science, and electronics overlapped. They planned a weekly project list of things they could do in either a team teaching situation or by actually switching classes with one another.

The next day, the Bayside team shared their plans with other participants at the workshop. Workshop leaders from the university were amazed at how quickly the Bayside team had laid the groundwork for what they planned to do.

During the latter part of the first semester following the workshop, the university workshop leaders came to Bayside to observe what the three teachers were doing and to discuss how the integration activities they had planned were progressing. They learned that most of the integration activities the team had planned turned out to be successful. Further, they learned that the team was busy planning additional integration activities.

The university people also spoke with Walter Vaughan, asking him how much extra time the three teachers had for planning. He reported that the three teachers meet before school, after school, during lunch, and at any other times they can manage to get together. He continued, "I could have helped these teachers secure extra planning time, but it was not necessary. They are so enthusiastic about what they are doing that they find time to get together."

Discussion Questions

1. At Bayside, the integration of vocational and academic education is being phased in over time. Is it a good idea to involve only selected teachers when first starting to integrate rather than having all teachers planning and implementing coordinated instruction between vocational and academic education from the start? Why or why not?

2. What incentives—for example, workshop fellowships—will encourage teachers to integrate vocational and academic education?

3. To what extent does the availability of planning time impact on integration?

4. What are some possible reasons why the Bayside science, math, and electronics teachers were able to work together so effectively?

5. Why did the team approach used by the Bayside science, math, and electronics teachers seem to work? How could you apply the team approach to integration at your school?

Case Study 5

The Importance of Terminology

Priscilla McKean, the principal of Rockford High School, recently scheduled an inservice activity for all teachers involving a discussion of how to get started integrating vocational and academic education. One of the speakers, a vocational teacher from another high school where integration is well under way, suggested that the vocational teachers invite academic teachers and their students to their classes for the purpose of helping the students understand hands-on applications of academic content. At the refreshment break following the presentation, Melissa Haygood, the physical science teacher at Rockford, introduced herself to Wendell Quesenberry, the new machine tool operations teacher. As the discussion progressed, Melissa discovered that the application of a number of the physical science concepts she was teaching could easily be demonstrated on equipment available in Wendell's laboratory.

During the next several weeks, Melissa continued to think of ways the physical science concepts she taught could be demonstrated in the machine tool laboratory. She decided that at the next integration session planned for the last Thursday of the month, she would talk with Wendell about bringing her students to the machine tool laboratory. They could then gain first-hand knowledge of how to apply the concepts she taught. Before the meeting started, Melissa talked with Wendell and learned that he would be glad to have his students serve as hosts for the physical science students. Melissa and Wendell agreed on three class dates that the students would visit: the first Thursday of the next three months.

In preparation for the students' first visit, Melissa went to the machine tool laboratory before school on Tuesday morning. She and Wendell discussed and agreed on what concepts would be demonstrated and on which pieces of equipment; they also agreed that Wendell's students would operate the equipment, and that Wendell would describe what was happening. Melissa would then explain the physical science concepts being used.

When the "big day" arrived for the first visit from the physical science students, Wendell and his students had everything ready and had even practiced the demonstrations they would give. As the demonstrations proceeded, Wendell realized that he did not use the same terminology as Melissa in discussing what was happening in the demonstrations. He felt that her terminology was much more impressive.

Later in the day, Wendell was discussing with another vocational teacher what happened when the physical science class came to his laboratory. Wendell explained, "Before I have the physical science students visit again, I feel as if I need to brush up on my terminology. It is difficult for me to put a label on things the way that Melissa does. I know what all the things are, what they do, and how they work, but I don't use the proper terminology. I felt inadequate in describing things. At times, I felt as if the physical science students were looking at me as if I were kind of dumb. When planning the visit, Melissa did not say anything to me about the terminology being a problem."

He continued, "Melissa and I need to sit down together so that when the students visit again we act as a team. The situation for this initial visit was one of her being a visitor and my being a speaker without the basic knowledge needed for the subject I was discussing."

Discussion Questions

1. What things do vocational and academic teachers need to consider when undertaking team teaching efforts?

2. Is it a good idea to have academic classes, such as the physical science class in this case, visit vocational classes to have hands-on demonstrations of academic concepts? Why or why not?

3. What help does Wendell need so that he will gain confidence in his ability to demonstrate the application of academic concepts?

4. Why didn't Melissa recognize the problem with Wendell's use of the terminology prior to her students visiting the machine tool laboratory?

5. How can vocational and academic teachers effectively share information about what they teach and the terminology they use?

Case Study 6

Different Courses, Different Students, Different Teaching

Roger Yarborough started his teaching career at Valley Technical High School three years ago, the year that the integration of vocational and academic instruction was first tried at the school. Having just completed requirements for certification as a language arts teacher, Roger had practically no exposure to vocational education prior to coming to Valley Tech. In describing what happened when he first worked with the vocational teachers, he notes, "The situation would have been a whole lot better if I had understood what a vocational technical school really was. My college preparation gave me little if any insight into the needs of the students here and how the vocational teachers work with the students."

Initially, Roger was assigned to a cluster of teachers that included vocational, language arts, mathematics, and science teachers as well as a guidance counselor. He started to interact with the vocational teachers on both a social and work level. He says, "I felt comfortable, for example, going to the vocational teachers and telling them that I needed a sample job application before the end of the week. I didn't realize how busy a vocational teacher's day is, being a new teacher myself." Roger continued, "The vocational teachers helped me, but I could tell that I was imposing on them."

Since then, Roger has learned a lot about vocational programs. He has read extensively and last year he attended a trade show with the instrumentation technology teacher and some of her students. Roger has also learned as much as possible about his students' part-time cooperative education jobs. Further, he tries to relate what he teaches to job skills the students will need and has even accompanied the vocational teachers on visits to student work sites several times.

In describing how this exposure to vocational education instruction and vocational teachers has affected his teaching, Roger explains, "I took it upon myself to get out of the academic pattern of teaching straight grammar, literature, and so on. I now see how important it is to relate what students are doing in class to the world of work. What I teach is not watered down; I feel very confident that my students can go on to college if they want or they can go directly to work in their occupational specialties."

Further, Roger says that he now is much more considerate in making requests of the vocational teachers. "All too often," he notes, "we think other teachers have a very easy day. I, personally, know they do not; and I tell my students that I know this. When I first taught, I didn't understand the problems of dealing with students all day long with diverse needs and ability levels." The vocational teachers plan a broad range of individualized activities to meet their students' needs.

Discussion Questions

1. What are some strategies that could be used to acquaint all new teachers with the cluster concept used at Valley Technical High School?

2. What are some ways that vocational and academic teachers can learn more about what goes on in each others' classes?

3. What impact does teaching experience have on achieving the integration of vocational and academic education?

4. What knowledge of integration should experienced teachers expect of new teachers?

5. How should academic teachers approach vocational teachers for help? Likewise, how should vocational teachers approach academic teachers for help?

Case Study 7

Shifting from "Us and Them" to "We"

Media specialist Mary Sue Rotousky came to Greg Dickerson, the principal at Castleberry High School, to complain about the "Navigating the Workplace" projects that freshmen students were completing as part of both their English and vocational exploratory classes. Her rather vivid description of the projects was "The whole thing is making the teachers and me look like we're falling on our faces." She continued, "The students are coming to the library with their vocational teachers, and they do not have a clue as to how to go about completing their research assignments. As the one in charge of the library, I am really fed up with this because these students distract everyone else in the library. They need some direction and a framework to guide them before they start library work. In trying to help these students, I have learned that no communication exists between the vocational and English teachers and that the students have no sense of direction."

After hearing Mary Sue's complaint, Greg quickly organized a meeting of the two groups of teachers and invited Mary Sue to attend. The teachers decided to have the students stop working on the projects and to devote their next teacher inservice day, scheduled later that month, to clarify the details for conducting the projects. The projects had been developed by a committee consisting of Mary Sue, two vocational teachers, and two English teachers. Their purpose was to set the stage for the integration of vocational and academic education that would occur throughout the students' high school years.

Initial discussion among the teachers on the inservice day quickly revealed that they really did not have a clear understanding of their roles in helping the students complete the projects. Each group thought the other was in charge. They decided that they needed one person who could be counted on to know the details for completing the projects and who would maintain information about who was responsible for what in getting the projects completed. Not surprisingly, they asked Mary Sue if she would help by assuming this role. They didn't intend for her to do the work of designing and carrying out the projects with the students. Rather, she would help by knowing what was involved in the projects and by keeping on file in the library the details for completing them. Then, every teacher involved with the projects would have access to specific information about them.

The group began compiling details for completing the projects. They started by determining the objectives and then determining, step-by-step, what the responsibilities of the vocational teachers and the English teachers would be to ensure that the projects were completed. The teachers discussed problems they had encountered in project completion. For example, a drafting teacher noted that the students resented going to the library during time they would have had to work on their design projects.

In describing how the meeting progressed to Greg, Mary Sue said, "My perception of the meeting was like a textbook dream. It was like something you would film to show an education class about how teachers can work together as a team. While we were listing the project objectives, everybody's enthusiasm for the projects mounted. We then fine-tuned the assignments. It was great. The English and vocational teachers valued each others' ideas. The focus became 'we' instead of 'us and them.'"

Discussion Questions

1. Why did the vocational and English teachers experience the shift from "us and them" to "we"?
2. What happened that caused Mary Sue, the media specialist, to be upset when the "Navigating the Workplace" projects were first tried?
3. When the projects got off to a poor start, was it a good idea to have the students stop working on them? Why or why not?
4. Why do objectives and procedures for completing projects conducted between vocational and academic classes, such as these "Navigating the Workplace" projects, need to be carefully documented and shared with all teachers involved?
5. How should media specialists, as well as other faculty, be involved in designing projects conducted cooperatively between vocational and academic classes that require the use of library facilities?
6. When curriculum integration projects involve a number of vocational and academic teachers, what role does a third party such as Mary Sue, the media specialist in this case, fulfill?
7. What should the drafting teacher have done to stimulate student interest in and commitment to the "Navigating the Workplace" projects?

Case Study 8

Coordination Gone Awry

At Hartsfield High, a committee of English and vocational teachers with the help of the assistant principal for instruction, Julia Leonard, spent two years planning projects coordinated between the classes of the two groups of teachers. Once the teachers finally agreed on the details of the projects, they gave a sigh of relief and looked forward to smooth implementation the next year. The first year the projects were used did indeed prove successful and the committee members complimented themselves on a job well-done. The projects were complex and relied on extensive coordination of activities between the English and vocational teachers. For example, the junior project required students to collect information about their vocational specialties and to complete interviews in actual work settings. The vocational teachers worked with the students to arrange the interviews and locate appropriate materials. Information the students collected was then used to prepare videotape presentations in their English classes.

That year, most of the teachers involved with the projects were members of the committee who designed them. Further, Jim Auburn, one of the vocational teachers, volunteered to serve as coordinator for the vocational teachers, assuring that deadlines for assembling the materials needed in the English classes were met.

The second year that the projects were used, things did not go quite as well. In describing what happened, Jim noted, "Several of the vocational teachers complained to me that the English teachers were not aware of the projects. The probable reason the English teachers did not know about the projects is that they switch class levels from year to year, teaching freshmen one year and, perhaps, juniors and seniors the next. The vocational teachers would come to me and ask what was to be done for the English projects each nine weeks and I would tell them. The English teachers, however, didn't know what was to be done. This situation went on for most of the year. Finally, some of the vocational teachers became so frustrated that they went to Julia, the assistant principal, to let her know that the projects were not being carried out, indicating that the English teachers did not know what was to be done. Personally, I knew what I was to do, so I did my job and did not feel it was my concern if the English teachers did not know what to do."

During the second year, the English teachers also expressed concern about the projects. Herb Ellenberg, an English teacher at Hartsfield for 20 years and a member of the projects committee, went to Julia to describe problems the English teachers were having. He was particularly upset about the sophomore project. He explained, "The students were assigned in their English classes to write a paper about a particular career. They were to investigate what was happening in the career field and what technologies were being developed. They needed help from the vocational teachers to assemble the information needed for the projects. Most of the students' papers were horrible; they just didn't get the information together that they needed to write the papers." Herb was so frustrated about the poor quality of the sophomore projects that he asked Julia to suspend the project for the following year.

Discussion Questions

1. Why were the projects between the English and vocational classes a success the first year?

2. What happened that created problems in carrying out the projects the second year?

3. Should specific guidelines be developed for projects to be carried out cooperatively between academic and vocational teachers? Why or why not? If they were developed for the projects described in this case, what would they contain?

4. In this case, Jim served as project coordinator for the vocational teachers. Did the English teachers also need a coordinator? Should a member of the administrative team serve as coordinator? What responsibilities should the coordinators fulfill?

5. Jim noted that he knew what he was to do and that he had done his job. Further, he did not feel it was his concern if the English teachers did not know what to do. How did his attitude undermine the integration efforts?

6. How could Julia Leonard have avoided some of the difficulties that surfaced during the second year of the projects?

7. What needs to be done to get the English and vocational teachers back to working cooperatively together as they did the first year of the projects?

Case Study 9

The Applied Approach Makes All the Difference

In an effort to improve the education that students were receiving at Glassborough High School, the teachers had started a number of different initiatives. Included in these were dropout prevention programs, raising students' expectations, and emphasis on career guidance for all students. After focusing on these initiatives for three years, one area where the principal, Roland McMurphree, felt little change had occurred was in moving instruction to an applied approach, a teaching method that facilitates the integration of vocational and academic education. "Changing the way instruction is delivered is hard to do; it is difficult to give up what we're familiar with" was Roland's explanation for the lack of integration activities.

Roland noted several possible reasons for the lack of change toward integration. Glassborough High students attend their vocational classes at the same site as they attend their academic classes but in separate facilities. The two buildings are about a 5-minute walk apart. Additionally, vocational teachers have tended to associate with one another and academic teachers have tended to do likewise. Even at meetings of the entire faculty, the two groups of teachers have pretty much stayed to themselves. As Glenda Carmody, one of the vocational teachers, explained to Roland, "About the only contact we have with the academic teachers is by phone to discuss student grades or other student concerns."

Roland decided it was time for action. He formed a team of teachers with members selected because they were perceived as leaders by their vocational and academic colleagues. In early July, the team members were sent to a national conference to learn how other schools were integrating vocational and academic education. Following the conference, the team had two weeks to write applied curriculum activities that could be implemented by all teachers. The activities were to emphasize real-world uses of academic concepts and related theories to the students' vocational specialties.

At the end of the second week of writing, team member Justine Gilleski, who is a mathematics teacher, shared with Roland what was happening with the team. She explained, "For the past two weeks the team members have met, and met, and met, spending their time learning what went on in one another's classes. Based on what we learned, we developed a big packet of integration activities that is ready for final editing before distribution to other faculty. Further, we decided that team members will hold sessions with colleagues in their own departments to introduce the materials to them."

Since Glassborough High uses school-based staff development, Justine presented the activities to the other 17 mathematics teachers as part of the school's ongoing staff development efforts. In presenting the activities, she emphasized what she was planning to do in her own classes. The mathematics teachers were so enthusiastic about her presentation that they started to use the special Tuesday teacher planning periods to exchange with one another integration activities they were using in their own classes. Further, they made a special effort to have vocational teachers join them for these meetings.

In describing how successful the math department integration efforts have been, Roland notes, "One of the math teachers who really resisted the change to teaching through an applied approach has actually worked with several of the vocational teachers to develop two full books of integrated math activities, books that have been shared with other teachers at the Tuesday staff development sessions." This math teacher sums the situation up by saying, "I'm still the same old 'born-to-be' teacher, but this applied approach makes all the difference to the students."

Discussion Questions

1. What are some reasons why the vocational and academic teachers at Glassborough High did not communicate and share with one another?

2. Why do both vocational and academic teachers tend to stick with old, familiar teaching methods?

3. What are some reasons that the process Roland used to get the teachers to change from their old, familiar teaching methods was successful?

4. Why would using an applied approach improve mathematics instruction? How would it improve vocational instruction?

5. How might teachers serving as leaders for their peers in moving to the applied instructional approach facilitate (or hinder) acceptance of it?

6. What are the advantages of using school-based staff development activities when helping teachers to integrate academic and vocational education?

Case Study 10
Sharing with Parents

The teachers and guidance counselors have been using a variety of strategies to integrate vocational and academic education at Oak Grove High School. One strategy that the guidance counselors took the lead on was developing programs of study for all students entering the ninth grade. Each ninth grade student works with an assigned counselor to develop a challenging plan that provides preparation for employment as well as further study. For example, students whose plans include a sequence of courses in a vocational program also include sequenced English, mathematics, and science courses that prepare them for further technical study or for entry into a baccalaureate degree program. The effect of the plans is to eliminate low level, general track courses and to help students develop a focus for their studies. The plans eliminate the problem of students taking a hodgepodge of courses that leave them prepared for nothing when they graduate from Oak Grove.

At their weekly meeting, the guidance counselors were discussing how they could get across to parents the importance of students' programs of study. Cassandra Willander suggested a special day of parent conferences. This was not to be the typical conferences where parents came to discuss problems their children were having in school. Rather, these conferences would allow for vocational and academic teacher teams to meet with parents to discuss their children's futures. As the counselors examined the potential effect of the conferences, they became more and more enthusiastic about them. Further, when they presented the idea to the principal, George Constantine, he quickly gave his support as he had been trying to figure out a way to get more parent involvement. Oak Grove had joined a Tech Prep consortium with the area community college and parent involvement was one of Tech Prep's overall goals. With the help of the guidance counselors, George drafted a letter to the district superintendent letting her know that he planned to conduct the special day of conferences with parents.

With approval granted, George asked the guidance counselors to present their ideas about the vocational-academic team parent conferences to the entire faculty. In presenting the idea for the special conference day to the other faculty, Cassandra noted, "Parents are ultimately going to make the difference with students, and typically they meet with teachers to discuss problems. I believe having parents at the school on a friendly basis to work toward a common goal will be good for the students, the parents, and all of us."

The teachers liked the idea of meeting with the parents to discuss the positive side of their children's futures. They did, however, have some apprehension about how to conduct the conferences and asked the guidance counselors to provide an orientation session for them prior to the special day of parent conferences. The teachers wanted to learn what information should be shared with the parents and how it should be shared. At the orientation session, guidance counselors stressed the importance of having parents at the school on a friendly basis, of getting their support, and of working with them on the common goals both they and the teachers share for their children.

The whole school worked to publicize the special conference day. Announcements were prepared for the local newspaper and for local radio and television stations. Students were informed daily in a variety of ways about the special day, and several notices were sent home to parents. The conference day turned out to be a huge success. The faculty had anticipated about 100 parents would come, but to their delight more than 350 parents attended the conferences. In describing what happened when talking with a colleague from another school, Cassandra stated, "We all worked from seven in the morning until seven at night to get through the conferences. I got really enthusiastic that day when I saw academic and vocational teachers working together to discuss with parents the career paths related to graduation, the workplace, and the students' futures. Getting the teachers involved with other teachers in discussions with parents was really good. Further, the conferences gave parents useful information that helped their children in areas such as course taking and career goals. All the parents I have talked with since that day felt good about the experience they had."

Discussion Questions

1. What activities contributed to the success of the special parent conferences at Oak Grove described in this case?

2. Why are challenging programs of study for all students an essential part of effectively integrating vocational and academic education?

3. Why was it important that vocational and academic teacher teams meet with the parents?

4. What plans and arrangements had to be made for the parent conference with the teams of vocational and academic teachers to take place?

5. How can parent involvement affect the outcomes of integration efforts undertaken by the school faculty?

6. Besides planning the special conference day at Oak Grove, how else might the guidance counselors support the teachers' integration efforts?

7. What other career counseling activities could be conducted to promote parental involvement?

Case Study 11

Teacher Cooperation Leads to Learning Enrichment

At the Excellence in Education Conference, George Garcia described with pride to colleagues from across the state how teacher cooperation led to learning enrichment for students at his high school. The state university's College of Education was recognizing Old Southwest High School with an Excellence in Education award for initiatives linked to integrating vocational and academic education that the faculty had undertaken. At the conference, George provided a 30-minute presentation highlighting changes implemented at Old Southwest.

Six years ago, George was assigned as principal of Old Southwest at the request of the city superintendent. Old Southwest, located in one of the cities poorest districts, has more than 1,500 students, with roughly 60% from families with incomes below the poverty level. Further, more than 50% of the students receive special assistance because they are classified as at-risk learners. When George first came to the school, he quickly learned that many of the students were less than enthusiastic about their classes, which were mostly taught in the traditional way with heavy emphasis on academic theory.

During the second semester of his first year, George brought the mathematics and vocational teachers together to discuss what could be done to improve the students' performance in math. He was aware of the findings of cognitive psychologists indicating that learning is more effective when it takes place in context. As the meeting progressed, George asked the vocational teachers to detail how math was used in their occupational areas. He then asked the math teachers to discuss what they perceived as major barriers to the students' learning math. The teachers soon realized that they could help one another. The vocational teachers shared real-life examples of math use, and the math teachers helped by explaining math concepts that the students needed to master. The math and vocational teachers met periodically for the remainder of the semester to plan coordinated instruction emphasizing hands-on experiences for the following year.

During George's second year at Old Southwest, he followed a similar procedure with the science and vocational teachers. By the end of the third year, the math and science teachers reported that students' interest levels in their classes had improved dramatically.

Further, the vocational teachers reported that they found the students much better able to cope with the math and science requirements in their classes.

With this record of success, George decided during his fourth year at the school to have the English teachers meet with the vocational teachers. Several of the vocational teachers had expressed apprehension about working with the English teachers. They just didn't feel comfortable with teaching grammar, spelling, punctuation, and writing skills. George decided that a good starting point would be for the English teachers to clearly define writing expectations that teachers in other classes should have for students. As a first step, the English teachers prepared clear definitions of a sentence, a paragraph, an acceptable response to a discussion question, and the format for a short report. This information was printed on card stock and distributed when the English department presented an inservice program to the entire faculty.

In describing the outcome of the inservice program, George noted, "The importance of writing in the content area was stressed at this meeting. As a result, teachers were asked to have all students within the next month write at least two times for each of their courses. Each teacher was also asked to emphasize the importance of writing in the content area. This procedure has worked very well and has stimulated teachers to talk with each other."

George continued, "As a logical extension of these writing activities, Old Southwest has initiated a program where senior students who are enrolled in vocational education courses prepare their English research papers on topics that are career or skill related. The purpose of the assignment is not to water down the English course but to enrich learning for students and have them do something they can be proud of. When the project was initiated, I thought it would be another tool to cause the teachers to talk to each other and to work together. The paper topic has to be approved by a committee composed of an English teacher and a vocational teacher. Sometimes, a counselor also serves on the committee. Once the topic is approved, the student then prepares a research paper following the standard guidelines used for the English class. When the students complete their papers, each is required to make an oral presentation or demonstration to the committee. Younger students are invited to the presentation so they can learn about careers and skill areas."

George concluded by saying, "When the teachers began the project, some of them felt as if they were simply taking on something else to do. The vocational teachers, however, remained positive and the English teachers found that students who often dreaded the senior research papers were much more interested in doing theirs. Further, the students have told me that their vocational teachers are really trying to help them complete their research. Vocational teachers have good technical materials and know where to get others. The vocational teachers are also able to facilitate interviews with individuals in business and industry. As you can see, teacher cooperation at Old Southwest High has clearly led to learning enrichment for the students, particularly our at-risk students."

Discussion Questions

1. What problems were the teachers at Old Southwest facing that led to their cooperating with one another?

2. At Old Southwest, the principal, George Garcia, opted not to involve all teachers in integrating vocational and academic education at one time. What are some advantages and disadvantages to this approach?

3. Why does the curriculum for some academic courses seem to be more easily integrated with some vocational courses than others? What are specific examples of vocational and academic courses that are easily integrated? Why?

4. Should teachers expect students to display correct English usage skills in all classes?

5. How was student learning enhanced through the math and vocational teachers cooperating with one another? Through the science and vocational teachers cooperating with one another? Through the English and vocational teachers cooperating with one another?

6. What are some reasons that the teachers' cooperative efforts could prove helpful in meeting the at-risk students' needs?

Case Study 12
Reinforcing Academics

Arnola DelRico, a guidance counselor, meeting with counselors from throughout the school district, described some of the ways that vocational and academic education are being integrated at her school, Mantua Springs High. She noted, "One of the auto mechanics teachers shows the students that he is really interested in their developing academic skills. He sees the need for these skills in the business world and knows that the continual upgrading of automotive technology will require mechanics to be proficient academically."

As a counselor, Arnola has found that her most frequent interactions with students in vocational classes have related to discipline problems. One particular problem she notes is that the schedules of the auto mechanics students are all similar, thus they tend to be in the same academic classes. This leads to a situation where they frequently socialize instead of learning when in their math and English classes. John Tollington, the auto mechanics instructor, has helped eliminate some of these socializing problems.

For many years, John was a garage owner and he knows that auto mechanics need academic skills to succeed. He spends a lot of time in his class emphasizing the importance of doing well in academic classes. John tells his students, "With the complexity of cars today, skilled mechanics have to know more than just how to read simple manuals. It takes a student who is really good in reading and math to be a good auto mechanic."

Arnola explained to the other guidance counselors that as a result of the reinforcement given to academic skills by John, the auto mechanics students' grades have actually improved in their academic classes. Further, she notes, "The academic teachers tell me the students are more serious and focused on academics." Traditionally, students who enroll in vocational specialties are more interested in their vocational classes than their academic classes. She stated, "It is not that they can't learn academic skills, but they usually do not excel in them because the vocation is where their interests lie." She continued, "The academic and vocational teachers need to be emphasizing the link between the two types of classes."

As a result of John's reinforcement of academics, Arnola explained, "I have also seen an improvement in the attitudes of the auto mechanics students toward their academic studies and they are taking academics seriously. The discipline problem seems to be getting better as well."

Discussion Questions

1. What do teachers need to know and do to be able to reinforce what is being taught in one another's classes?

2. What are some ways to eliminate the scheduling problems associated with having students in specialized classes such as auto mechanics on the same schedule all day?

3. Why is it important for vocational teachers to reinforce the need for academic proficiency? Further, why is it important for academic teachers to reinforce the need for students to excel in their vocational classes?

4. Arnola indicated that the students' attitudes played an important part in their improvement in academics. How can vocational and academic teachers work together and with guidance counselors to help students gain a more positive attitude toward academics?

5. Besides reinforcing the need for academics as John did, how else can vocational teachers help develop their students' academic skills?

6. How can academic teachers help their students develop knowledge and skills needed in vocational classes?

Group II
Curriculum Strategies

"Curriculum Strategies" emphasizes the involvement of vocational and academic teachers in curriculum building that focuses on integrating vocational and academic curriculum content, organization, and sequence. Curriculum strategies focus on (1) meeting to plan projects and activities, (2) changing from past procedures in both program offerings and in class instruction, and (3) designing and enhancing the curriculum.

Case Study 13
The Turning Point

Joan Burton teaches engineering and architectural drafting at Andrew Jackson Vocational/Technical School. She also teaches a course in computer-aided drafting at the local community college. Her junior and senior level students are selected on the basis of teacher/principal recommendation. Joan has a reputation for being very demanding and for motivating students to produce superior work.

Joan requires her drafting students to prepare a portfolio with a complete set of drawings and daily journal entries. She works with an English teacher, Marie Sanchez, to evaluate the journals. When she first started assigning journal writing as a part of the portfolio, many students displayed a lot of resistance. They wanted to practice drafting, not writing.

Joan decided to help her students change their attitudes about writing. One day she invited a representative from the Federal Aviation Commission to speak to her class. During the speech, a student asked the representative if she thought journals were important. The representative held up her journal, which was about an inch thick and said, "I write in my journal every day." The speaker explained that she writes up all the details of what she does every day. This was a turning point for the students. "Now," said Joan, "they don't even question their journal writing assignment."

Marie was also pleased with the results. She commented, "You could see an immediate improvement in the students' journal entries after the speaker visited the drafting class. They now ask a lot of questions about how they could improve their journals. I have even noticed an increase in motivation toward their other English assignments."

Joan and Marie said that they realize the importance of both applied writing and of involving community people as part of the curriculum. They have been discussing new ways in which to coordinate speakers with curriculum activities. The primary problem is that since the most qualified people in the community have busy schedules, it is difficult to get them to commit to making a visit to the school.

Discussion Questions

1. Why did this particular speaker have such an impact on the students?
2. Why did the students have an increase in motivation for all of their English assignments?
3. If you were Joan or Marie, how would you go about arranging for qualified individuals from the community to visit your classes?
4. How should teachers help prepare individuals from the community, such as the Federal Aviation Commission representative, to make presentations to students?
5. What are the benefits for students, the school, and the community of involving business and industry in educational programs? How can business and industry partnerships with education facilitate the integration of vocational and academic education?
6. As a teacher, how could you implement portfolio assessment strategies that support the integration of vocational and academic education?
7. As a teacher, where could you get ideas for a quality portfolio assignment?
8. Joan and Marie have the same students in their classes. How does this scheduling of students facilitate their integration efforts?

Case Study 14
Confusion Reigns

Charles Pierre enjoys teaching English at Ridgefield High School, a large comprehensive school in a suburban county. He teaches junior and senior honors English, and has a reputation of being very demanding of students' work and very exacting in his evaluation of assignments. Charles has been teaching English for 18 years.

Several years ago when Jed Townsmen, the principal, decided it was time to start planning for the integration of vocational and academic education, Charles was somewhat resistant to the idea. During a faculty meeting at the beginning of the year, he argued that teachers should be given more planning time if the integration process was going to work. He stated that he had enough to do with his advanced English classes.

Somewhat reluctantly, Charles agreed to work with other English teachers and various vocational teachers on a freshman career project. Each student was to explore a particular vocational area and write a report. The report would be presented in both the English and vocational class. English teachers were to help the students with report grammar and style. Vocational teachers helped students locate and organize research for their reports in the students selected vocational areas.

Later in the year, after the freshman career projects were completed, Charles had this to say, "Getting the career project papers from the English teachers to the vocational teachers has not been a complete success at any point. The transfer of papers has not been a total bomb, but it has not been a success either." He explained that the process of getting the papers from the English class to the proper vocational teacher in an agreed upon time frame is not always easy. Since the students in all his classes have different vocational teachers, they did not learn of the joint assignment at the same time. Charles thinks that coordination of due dates and presentation of the assignment is as much a problem as the assignment content.

During the department meeting at the end of the year, Charles suggested that a manager was needed "to run the articulation project." He stated that the current procedures simply will not work if someone is not given time to coordinate the project. Marcella

Jones, one of the school's marketing teachers, along with several other teachers, agreed with Charles.

In a discussion that followed, however, no one could suggest a plan to implement this idea.

Discussion Questions

1. What did Charles categorize as the critical issue in his opposition to integrated education?

2. Was there any aspect of Charles' attitude that may have contributed to the problem he describes?

3. What might these teachers do in the future to address the problem that Charles and Marcella describe?

4. What kinds of plans need to be developed to establish procedures for conducting the careers project?

5. What strategies could be put in place to coordinate assignments between vocational and academic classes?

Case Study 15
Was It Miscommunication or Inexperience?

After 15 years of experience in industry, Bill Harris took a job teaching electronics at Hillsville Vocational High School. He has been at Hillsville for two years. Hillsville is a comprehensive vocational school located in an urban area with an enrollment of 800 students in grades 9 through 12. In addition to receiving a high school diploma, each graduate is given a vocational education certificate documenting mastery of job-specific vocational competencies.

Students at Hillsville have alternating weeks of instruction. One week students are in vocational classes, the following week they are in academic classes. As part of their academic course requirements, Bill's electronics students are required to take a physics course. The last part of the physics course deals with electronics. The vocational and academic teachers have been working together to integrate their instruction.

During lunch one day, before the start of the fall semester, Bill asked Tom Hernandez, the physics teacher, if he could switch the sequence and teach the electronics portion of the class first. Bill explained that doing this would coordinate physics course content with what was being covered in the electronics laboratory. Thus, the instruction that students received in physics would be integrated with electronics and vice versa.

Tom said he would have to think it over, but indicated that the switch should be possible. Bill did not have an opportunity to discuss this change any further with Tom but assumed that the electronics portion of the physics class would be taught during the first part of the fall semester.

After several weeks, Bill was disappointed to discover that his students did not seem to have an understanding of physics concepts at the appropriate times in the electronics laboratory. He discussed this concern with his students, asking them about what they were learning in physics. Their responses led Bill to believe that the information they needed was covered in physics class with an emphasis on theory. The students were not, however, able to transfer the theory they were learning in physics to the application level needed in the electronics class.

Bill said, "I guess integration is taking place, but I am not very satisfied. If I had to do it over, I would not have bothered with it. I would have continued to teach all of the physics portion of electronics myself."

Discussion Questions

1. What lessons may be learned from Bill's and Tom's experience with integration? If you were Tom or Bill, how might you approach an opportunity like this in the future?

2. Bill was dissatisfied with the outcome of his first attempt at integration with Tom, the physics teacher. What might Bill have done differently to assure success?

3. What could Tom have done to make the integration process more successful?

4. Why is it important that theory and accompanying applications be taught in both vocational and academic classes?

5. What can motivate teachers like Tom to make curriculum changes such as switching the sequence of instruction in the physics course?

6. What responsibilities do vocational and academic teachers have to follow-up with one another when curricular changes are being made?

Case Study 16
Teaming To Develop a Textbook

Lincoln High School is located in a rural county where agriculture is the primary source of income. It has a student population of 600 students in grades 9 through 12. Many of the teachers are natives of Lincoln County and have known each other all of their lives. As a result, many of the teachers have formed close-knit working relationships.

Bonnie Sturgill has taught math at Lincoln for five years; Bill Goldman has taught electronics there for six years. Bonnie and Bill have often informally discussed students they have in common. When vocational and academic integration was first being introduced in their school last fall, Bonnie and Bill decided to work together. Later in the school year, Bill asked Bonnie if she would be willing to start coming to the electronics laboratory to explain the basics of mathematical computation to his sophomore electronics students. Bonnie agreed to help out in Bill's lab and they arranged a suitable schedule.

Bill felt the students in that particular electronics class were as weak in math skills as any he had ever seen. He was thus quite pleased that Bonnie spent a lot of the time teaching the electronics students general math as related to electronics concepts that all the students needed to know. Bonnie worked with students who were having particular learning difficulties as well as students that seemed to understand general math without much assistance.

As a result of this six-month teaching experience, Bonnie and Bill developed a specialized textbook. The book covered math skills that were required for the electronics curriculum. Bonnie was very proud of the textbook that she and Bill had prepared. She said, "I have had much success working with remedial students using the abbreviated textbook. It reinforced what the students had already learned and provided very specific help in areas that they use in the electronics class."

In evaluating their effort at the end of the school year, Bill commented, "Bonnie and I saved quite a number of students who would have flunked out of the electronics curriculum because their math skills were just not adequate. I am very pleased with our work."

Discussion Questions

1. Bill and Bonnie appeared to be a very effective team. What key factors enable them to work so well together?

2. How did instruction in the electronics laboratory change as a result of this integration effort?

3. The specialized textbook was perhaps one of the best outcomes of their efforts. What are other specific areas where a textbook of this type would be beneficial?

4. Why was it important for Bill and Bonnie to focus on students who needed remedial help?

5. How might Bonnie and Bill proceed to share their math skill book with other electronics and math instructors?

6. Bonnie and Bill focused on students who needed remedial help. How could Bill have helped Bonnie with the other math students as well?

Case Study 17

Hands-On Experience Versus Class Attendance

Two years ago, a wealthy alumnus of John Jay High School donated money for the purchase of state-of-the-art video taping and video editing equipment. With this equipment and strong support from administration, Jerry Kennedy, the broadcast journalism teacher, has been able to build an impressive program that is the pride of the school district.

Jerry has even volunteered the help of his students to other teachers. His students help by editing videotaped materials and doing live taping for the teachers. The psychology, literature, and social studies teachers often come to Jerry for this help. Usually arrangements can be made for the students to do these things during their broadcast journalism class or their free periods. Sometimes a problem arises, however, when students who do the taping must be excused from academic classes. A few of the academic teachers will not excuse the students for this activity.

Admitting that requesting students be excused from classes is not a popular practice with several teachers, Jerry explains, "I feel that the hands-on learning the students get from taping is so valuable that having them out of their classes to get the experience is justified." He notes, however, that he senses some resentment on the part of a few academic teachers toward his students. At a recent faculty meeting, one of the academic teachers even made a sarcastic remark about administrative bias towards "high-priced" video equipment.

Jerry says that some teachers seem to perceive lecturing as the only real teaching since that is the teaching method most often used in college. "Today's students are not motivated by lectures. By my way of thinking, many students are motivated electronically." Therefore, he argues, instruction that can be linked to the use of electronic devices will be highly motivating to them.

Since several of his students have gotten jobs in broadcasting right out of school, Jerry is adamant in arguing his position. He feels that this is proof that the experience his students get taping and editing tapes is as important as anything they learn in high school. He states emphatically, "This is the information age. These academic teachers need to realize that some of the old ways just plain don't work anymore."

Discussion Questions

1. What are some reasons for the resentment towards Jerry and the broadcast journalism program that seems to exist on the part of some teachers at John Jay High School?

2. How can Jerry gain the cooperation of the academic teachers with whom he is having problems?

3. Jerry argues that since his students often get jobs in the broadcast journalism field right out of high school, hands-on experience can be more important than classroom instruction. How would you respond to this point of view?

4. How can the other teachers work with Jerry to take advantage of what he sees as students being "motivated electronically?"

Case Study 18
Should They Pull Them Out?

Located in the suburbs of a major city, Dunbar Vocational Center has an enrollment of 400 students and employs 14 faculty members. It serves six feeder high schools throughout the county, offering 15 vocational programs. Most of the faculty, unlike the administration, have extensive experience in business and industry.

Monique Jackson, who had owned and operated a successful nursery school for over 20 years, is a second year teacher at Dunbar. She had always dreamed of becoming a high school teacher and is now enjoying her position in her second career. Monique teaches occupational child care classes with a total enrollment of 60 students. Because she is always willing to give extra time during lunch or after school, Monique is very popular with her students.

Although she thinks the administration's approach to integration is sound, Monique is having problems coordinating her work because of the "pull-out" system used at the school. Under this system, students with deficiencies in mathematics or English are excused from part of the three-hour child care laboratory time to attend classes taught by on-staff academic instructors at the vocational center.

"The pull-out system takes students from my classes at different times, so I have students on four different levels in the same class. Besides having different learning abilities, the students are completing work of the first, second, third, and fourth semester at the same time." Monique feels that administrators initiated the pull-out system more to keep vocational enrollments up than for the best interests of the students. As a new teacher, however, she is hesitant to express her feelings to her principal.

Monique says that when the pull-out system started, the vocational and academic teachers thought they would be using an infused instructional approach. Through the infused approach, students would be receiving their instruction in math and English as part of their vocational instruction. "Now, with the pull-out system, there has been some alteration in the English course, but very little is related to the needs of the vocational students." Monique thinks, for example, that studying the works of Shakespeare should be a part of the curriculum of their home school.

Monique would like for the English and math skills to be more related to the students' vocational programs and to real life in general. She says, "when my students are working on memos to parents, the English teacher could help them out. Or, when the students are studying what it costs to live on their own, to have a car, and so on, the math teacher could relate instruction to budgeting and finances.

Monique would like to see the English and math teachers come into her classroom rather than just helping students that are pulled out. The biggest problem is structuring the occupational child care class to include students missing that much time and students who may miss a whole skill session: "If I have a demonstration, I can't always wait for the pulled-out English and math students to get back." Also, she is concerned because she has only Mondays and Fridays to do reviews because on the other days preschool children are there in the class.

"When my students go out to get a job, they are expected to know everything. Employers won't buy students saying they were in English class when a certain skill was taught."

Discussion Questions

1. What reservations does Monique have about the pull-out system used in her school?
2. List the positive points in implementing a pull-out system. List the negative points. Does the pull-out system reflect an effective way to achieve integration of vocational and academic education? Why or why not?
3. Monique has strong opinions about the pull-out system. How can she address these issues with her principal?
4. What responsibility should Monique assume in helping English and math instructors to relate their instruction to child care?
5. When Monique speaks to her principal, she needs to have formulated an alternative plan. Discuss a few alternative plans and how Dunbar might benefit through implementation of these plans.

Case Study 19
Making Math More Relevant

Ron DeSanto, a math teacher at Central High School, had worked for a number of years in manufacturing supervision prior to his teaching career. So when he taught math, Ron always tried to give real-world examples. However, sometimes there was just not enough time to spend on this type of activity. When a colleague, Bill Newton, approached Ron about coming to the electrical construction laboratory to teach math to his students, Ron was very receptive.

Bill described Ron as a very animated teacher who could "tell lots of personal stories to relate math skills to electrical construction." Bill explained that many of his students fail because of their poor math skills, which in many cases resulted from never having been successful in math. He talked about when Ron first started coming to his lab: "The students thought it was a pain, just something that they had to worry about. They came to the vocational school to learn electricity, not sit in a classroom doing math problems." After a few visits from Ron, however, the students began to look forward to his math lessons.

Both Ron and Bill noticed that by doing math on a more informal basis, their students were more motivated. Bill went on to say, "It has led a lot of students to take higher-level math classes because they are not afraid of math anymore. The electrical construction students can see some relevancy between learning mathematics and what they are going to do in the trade area."

When the tentative teacher schedules for the following year were announced, Ron realized that he would not be able to continue visiting the electrical construction lab. Since then, he and Bill have been wondering what they might be able to do about this problem. They both agree that the collaboration worked so well that to discontinue it would be a great loss to the students.

Discussion Questions

1. How did Ron's previous work experience influence his approach to teaching?

2. Although the electrical construction students resisted at first, why did they eventually respond favorably to Ron DeSanto's visits?

3. What might Ron and Bill do to ensure that they can continue to collaborate next year as they have done this year?

4. Assuming that Ron and Bill cannot continue to collaborate as they have this year, what alternatives can they explore?

Case Study 20
Time for Change

Ted Porter has been teaching industrial arts for 21 years. For the last 14 years he has taught at Memorial High School, a large comprehensive school in an urban area of the Northeast. He has expressed a mistrust of attempts at innovation and has been known to say, "If it's not broken, don't fix it." The administration has mandated changes in the industrial arts curriculum moving more toward technology education. Ted has been assigned two sections of communication technology, formerly graphics, for the past three years. He has incorporated lessons in the communication technology class that he had used for years in his traditional graphics classes.

Last fall, a career project was initiated at Memorial High that required students to write reports about the technology of the careers they are exploring in their vocational classes. Also, students were required to revise the reports and present them orally in their English classes. Ted was initially resistant to this project because he felt his time spent in class was already full. He said, "I don't like to change my curriculum. I might teach the same thing for 10 or 12 years without changing. I think that this is easy for the English teachers; they can simply adopt this project assignment so that it fits into what they are already doing."

Now, near the end of the school year, Ted is somewhat more enthusiastic about the project. He says that when the students in his classes worked on the technology reports, he encouraged them to express themselves and not to worry too much about grammar and sentence structure on their first drafts. His understanding was that the English teachers would work with these elements. He thought that the content of his students' reports was very good. He felt that the students were demonstrating an awareness of technology and an understanding of how inventions have advanced society.

Ted was impressed with how much time Mary Canfield, a first-year English teacher, spent helping students rewrite their reports in her class. However, he was disappointed when two other English teachers, Joe Rielly and Susan Francis, commented to other faculty members about grammar and syntax errors on his students' reports. They felt that writing skills were not being stressed as they should be. Ted, in turn, felt that these teachers should be responsible for emphasizing writing skill components in their classes.

Overall, Ted is pleased with the outcome of the project. Just the other day, he stated, "The projects helped keep me up-to-date and to see the relevance of what I'm teaching. The freshman projects really helped students in deciding on technology-related careers. Best of all, I feel good because the reports made me interact with the students more."

Discussion Questions

1. What in Ted's experience made his acceptance of the integration concept more difficult?

2. Not all the English teachers were in agreement concerning the career project. How could the roles that the vocational and academic teachers had in the project be more clearly defined?

3. What do you think Ted's attitude about integration will be in the future? Why?

4. How did the students benefit from the career projects they prepared for their English and communication technology classes?

5. Did Mary's being a first-year English teacher make a difference in her attitude about the career project?

6. What approach could be used to help Ted understand the "writing style expectations" of the English teachers?

7. What kinds of help do vocational and academic teachers need when implementing a project such as the one described in this case?

Case Study 21
Building a Better Mouse Trap (Car)

Randy Brown and George Stewart were among six teachers from John Dewey High School who attended a summer regional conference focusing on the integration of vocational and academic education. Randy, a twelfth grade science teacher, and George, a construction teacher, had decided to attend the same workshops at the conference in order to get ideas about how they could work as a team during the next school year.

Randy, who had taught science for 22 years, felt that he needed some inspiration and some new ideas. He has concluded that students have changed over the years and that, "many of the his tried-and-true teaching methods were not working with today's students." He and George were impressed with several ideas presented in the conference workshops, especially those that involved projects suitable for team teaching. They agreed to get together and prepare coordinated lesson plans for a special project when they returned to school in the fall.

True to their intent, Randy and George began working together as the school year started. Based on suggestions given at a conference workshop for stimulating students' imaginations, they planned a mouse trap car competition. Students from the physics class and from the construction class would meet together in the construction lab. They would be challenged to apply the physics and the construction principles they were learning by designing a car that was powered by a mouse trap only. No other limitations would apply.

The project was initiated with much enthusiasm on the part of the two teachers and their students, but a problem soon became apparent. A wide variation existed in the ability of students participating in the competition. The physics students were more theoretical in their thinking but inexperienced with hand tools, while the construction students were more dexterous but verbally less articulate.

In one student's case, for example, her parents were both engineers, and she came to class with some very good theoretical ideas from home. However, the ideas could not be implemented with the resources available and the student became very discouraged. A few of the construction students told their teacher privately that they were afraid they could never understand the scientific principles that were being discussed by the physics teacher and therefore were afraid their mouse trap cars would be inferior. Some of the construction students argued that they did not need to know any physics to build their cars.

Randy and George discussed these and other similar problems that were occurring and decided that perhaps the project would work better if they had the students form teams. The teams would have to include at least one student from physics class and one from construction class. The teachers had to help with the arrangement of a few of the teams so a compatible mix of skill and knowledge would exist. An entire class period was spent forming the teams, but in the end both the students and teachers were happy with the results.

The student-team approach helped somewhat but did not miraculously solve all the problems. Communication among the team members was still difficult in several cases, and communication between certain teams and the teachers was not very effective. The project took two weeks longer than originally planned and Randy and George spent nearly twice as much time meeting after school as they had anticipated to work out some of the problems.

In the end, several impressive cars were made and the students said they enjoyed the project and felt they learned a lot. However, Randy and George had some strong reservations about the project and questioned whether, with all the unexpected problems, it was worth doing again. They made no plans to team teach for the rest of the year.

Discussion Questions

1. Why is it that ideas for integrating vocational and academic education discussed in workshops sometimes prove difficult to implement in the classroom?

2. Regarding students involved in the project, what was the underlying problem with the mouse trap car competition?

3. The idea of having the students work in teams alleviated some of the problems with the project. What other approach may have been helpful?

4. What steps could the two teachers have followed to "set the stage" for the mouse trap car competition project with their respective students?

5. What learning objectives should the two teachers have stated so that the physics students would see the need for applying what they are learning in the real world and so that the construction students would see the need for physics?

Case Study 22

The Business of Learning

Pete Dolinger, the marketing teacher at Ridgefield High School, has always looked for ways to be innovative in his classroom. When the initiative to integrate vocational and academic education was begun at Ridgefield, Pete was 110% ready to go. He teamed up with Hank Evans, an English teacher, and Kate Stein, a biology teacher, to establish a business academy.

The group decided to target some of the at-risk students who were not succeeding as well as the teachers felt they could. The teachers agreed that if the students could be encouraged to feel more a part of the school, they would be more committed to their work. Through the establishment of a business academy, the students would form their own business enterprise for the purpose of developing and marketing a product.

Quality Oil Company, one of the area businesses that had adopted Ridgefield, agreed to sponsor the project. With this support, the teachers and students gained confidence that they could "make something happen." Deciding that the product would be motor oil, the students designed the oil bottle and the label and determined what oil viscosity would be best to select. Further, they mapped out an extensive promotional campaign. Students worked in small task groups and were given time to work on the project in marketing class and English class.

The students wrote a commercial and a rap song related to the product. Considering that a total of 180 cases of oil were sold, the advertising was effective. At the end of the year, the students decided to use the profit from the business, after setting aside a small portion for a pizza party, to provide money to students who could not afford tuition for summer school.

Pete says the whole project was extremely successful. He explains, "Although some other teachers were initially skeptical about the project, they soon came around when they saw how excited the students were. These are students who had never been excited about anything since they had been at Ridgefield." He feels the business academy has made a big difference in the lives of the students.

The academy will be operating again this year with the students planning to market a car kit for which they have already begun the market research. "Even more important," Pete stresses, "is the difference at the school level. There is a renewed excitement that is very refreshing." As an extension of the business academy, a new program for ninth graders called Jump Start will begin this year. It is patterned after the business academy for the purpose of facilitating successful experiences for larger numbers of at-risk students.

Discussion Questions

1. Why was the business academy project so successful with at-risk students?

2. What kinds of learning objectives did the teachers stress through the business academy project?

3. The success of the business academy depended on a huge time commitment on the part of the teachers who were involved. What specific things did the teachers do to contribute to the success of the academy project?

4. The academy model, a school-within-a-school, has gained popularity in recent years. What are some of the advantages and disadvantages of grouping certain students with the same classes and teachers throughout the school year?

5. How did support from the business community help to ensure the success of the business academy project?

Case Study 23
Getting Back on Track

In her eight years of teaching ninth grade English at Freemont High School, Sue Franks has become concerned about the increasing discipline problems and failure rate of some of her students. Many of these at-risk students drop out before graduation. Thus, she was enthusiastic when her principal announced the school division had received permission from the state to offer summer make-up courses for the students who had failed these courses during the year.

Some of the students who had failed English were tenth graders who wanted to go to the career center to complete occupational preparation programs, but could not because their grades were too low. Sue says, "We felt that getting these students back on track would enable them to attend classes at the career center. I, for one, feel that the half-day career center programs are the only reason some of my students stay in school. So this issue is crucial."

The summer make-up program was established to provide students who had failed courses during the school year with an opportunity to repeat these courses on an intensive basis during the summer. The program was designed to help students stay in school, qualify to take courses at the career center, and graduate with their peers. In one month during the summer, the students can take what is usually a year-long course at Freemont High. Students can then go to another high school and take another course for a month. "In this way," Sue explains, "students can complete an additional one to two credits which puts most of them right back on track."

Sue admits that since the English class she taught ran from 8 a.m. to 3 p.m., she had some apprehension about the length of time the group would be together. Some of these students had failed three courses during the year and were not motivated to work on academics. She says, "I knew that it was important to provide a variety of activities for the students. As part of the course, we talked about the importance academics serve as the basis for vocational studies. We also discussed the job interview and the résumé."

Sue says that she quickly appreciated the full-day class period. She notes, "There were opportunities for students to work on their writing, speaking, reading, grammar, and composition. Once I related the students' assignments to their vocational interests, the motivation increased and the work was done." All the students received credit for the make-up courses and all are back in school this year. Since they are now able to take courses at the career center, Sue continues, "I believe the program will really make a difference. The secret is relating the academics to the students' career interests. These students will work in English class if they see the relevance of the learning to their lives."

Discussion Questions

1. What do you think of an academic class that meets from 8 a.m. to 3 p.m.? How might the students react to it?

2. Sue thought the repeater program was beneficial. Can you see any problems with a program of this type?"

3. Sue mentions talking to her class about job interviews and résumés. What other work-related issues can be discussed in English class?

4. What resources do English teachers need to add vocational contexts to their instruction as Sue did?

5. What do academic teachers need to know to incorporate vocational contexts in their instruction?

6. How could vocational teachers help Sue with the make-up English class she teaches?

Group III
Instructional Strategies

"Instructional Strategies" focuses on teacher involvement in actual instruction that integrates vocational and academic education. Instructional strategies consist of (1) initiating integrated instruction such as incorporating vocational and academic skills in instruction and approaching instruction through application; (2) teaching cooperatively by making joint assignments, teaching units at the same time, and team teaching; and (3) sharing community resources in instruction.

Case Study 24
The Student Does the Teaching

Jennifer King is a young, eager second-year math teacher at Doe Run High School located in a small rural area. Doe Run High School sends students to Pace Vocational School for their half-day occupational programs. Jennifer is one of three math teachers at Doe Run. The math teachers use a lot of equipment in the applied math classes to demonstrate math concepts. Jennifer has used compasses, protractors, rulers, and other math tools taught in education courses. However, this past year she tried working with vernier calipers and micrometers in an applied math class. Jennifer had never used these math tools before.

During math class, Jennifer noticed that Greg Morgan, a student involved in auto mechanics, was familiar with the vernier calipers and micrometers that she was trying to explain as a unit of instruction. Jennifer was extremely uncomfortable teaching the use of these tools. She explained, "I was doing a really poor job of teaching. I was trying to teach how to use these tools from the book and it was not working." Greg explained to Jennifer that he had used vernier calipers and micrometers in his auto mechanics class at Pace Vocational School. Then, Greg explained the use of vernier calipers and micrometers by actually demonstrating their use to other students in the class.

Greg enjoyed helping his math teacher and the other students learn the practical use of vernier calipers and micrometers. He was proud of himself and what he had learned about the use of this equipment in the auto mechanics laboratory.

After school, Jennifer went to the auto mechanics teacher, George Jones, and told him about Greg teaching students in her math class how to use vernier calipers and micrometers. George proceeded to assist Jennifer to better understand the use of these tools. She appreciated his help.

Jennifer continues to talk with George about the equipment and tools that he uses to teach math concepts. When she reads something in the math book that is technology oriented, she visits with George and asks him to explain the procedure. Jennifer explains "I feel very comfortable asking for help from George. However, George says he is intimidated because he feels I know so much more math than he does. But I feel that he knows more math because he uses the hands-on approach to teach math every day. I have been teaching math using the theory approach."

After having taught applied math for almost two years, Jennifer feels the students view math teachers differently. The students are pleased that their math teachers have taken an interest in learning more about their vocational preparation. Jennifer also feels that the students have more respect for academic skills that are necessary to be successful in vocational classes.

Discussion Questions

1. Why do you think Jennifer thought it was a good idea to let Greg teach the other students about vernier calipers and micrometers?

2. Did Jennifer and George, the auto mechanics teacher, work together to create a positive climate for the integration process? What more could they do?

3. Why does Jennifer feel that George has knowledge about math that she does not have? Why does George feel that Jennifer has knowledge about math that he does not have?

4. Some vocational teachers are intimidated with the theoretical knowledge that academic teachers have while some academic teachers are intimidated with practical know-how that vocational teachers have. What are some strategies that can help vocational teachers and academic teachers work together without feeling intimidated?

5. What might be happening throughout the school system to upgrade deficient teacher skills?

Case Study 25
But, It Takes Time

Jan Koon, the principal at North High School, was trying the get the business teachers to work with the English and math teachers on the integration of vocational and academic education. He had just returned from a national conference featuring several schools that had successful integration activities. Jan wanted to implement this concept at North High School. He had not received any extra funding for such a project, but he felt it was a great idea, one right for the times.

Jan came up with the idea to implement the integration by requiring each of the five business teachers to plan at least one activity per month with one of the math teachers or one of the English teachers. He sent a memorandum to the business, math, and English teachers explaining this new instructional activity. Further, he explained that the activity had to be written up and turned in to the principal's office by the end of each month.

Sharon King, a business teacher, thought that it was a natural blending to integrate business and English. She chose to work with the English teachers. However, she had to spend extra time to plan and integrate these activities. She explained, "I had to figure out when the English teachers were going to do certain things and then I could plan my lessons around that. Further, I had to teach ways of doing things that the English teachers preferred." Sharon felt that the integration activities were taking a lot of time away from her traditional instruction in the classroom.

Sharon also felt as if she was forcing some of the integration activities so she would have something to turn into the principal's office. This extra assignment to plan and integrate at least one activity per month was also disrupting what Sharon actually taught. For example, if students in the English classes were writing reports, Sharon would plan to teach the students at the same time how to type reports. She sometimes needed to make adjustments to her schedule to coordinate this type of activity. In other words, she might have to skip around or change the order of content typically taught when planning her instruction.

In addition, differences existed between what the English teachers wanted and what the business teachers taught. For example, the title page the students were doing for

English was not the same as they learned for business. Sharon, therefore, had to adjust. She told the students that if they had no other instructions, the way that she had shown them was a good way to do a title page; however, if they were told to do it a different way by their English teachers, they should do so to avoid getting it wrong for English class.

Further, Sharon explained to the students that there were a lot of correct ways to do a title page. But, in the back of her mind she was wondering if the English teachers realized that there were several acceptable ways to do a title page for a report. Sharon felt that the English teachers were too rigid in their instruction.

Discussion Questions

1. Sharon seems to be making all the adjustments for integrating the instruction of business and English students. What might she do differently to better facilitate the integration process?

2. Is it common in high schools for two teachers to teach the same lesson using different rules? Give examples.

3. Suggest some activities that Sharon and the other business teachers might arrange to make the integration of business and English instruction more meaningful.

4. What might be done to improve communication between the business and the English teachers?

5. Suggest some activities that the business and the English teachers might undertake together so they can align their respective curricula more effectively.

6. If you were the principal at North High School, how could you encourage the vocational and academic teachers to integrate their instruction?

7. How might reports generated by local businesses be used to facilitate instructional integration?

Case Study 26
The Formula for Interest

Jim Bear, a math teacher, works at I. T. Mann Comprehensive High School located in an upper-class urban neighborhood. Jim and the business teacher, Larry Stone, started talking one day in the teacher's lounge about math concepts they were both teaching in different classes. The two teachers noticed they had similar content in some parts of their texts. Jim explained that in his math concepts class, the students were to the point of understanding and manipulating formulas. However, these students still had trouble solving for one variable in a long formula with several variables. Larry agreed with Jim that the students did not understand how to find answers to math problems, even practical application problems such as interest and discount calculations.

Later in the semester, Larry was preparing to introduce the topic of calculating interest in the computer applications class he was teaching. He came to Jim in the math department after school and asked which formula he was using to calculate interest. Together they decided to begin with use of the simple interest formula. The next day Larry introduced the formula in computer applications class. The students did substitutions using calculator capabilities on their computers to solve problems.

Two weeks later when Jim taught the unit on calculating interest, he reinforced the topic. He briefly introduced the formula because the students had seen it before. Then he had the students manipulate the formula. They started solving problems to find interest using calculators. Then they moved away from using the calculators. For example, Jim would have the students solve for rate, time, or interest.

After Larry introduced the topic, Jim did the follow-up. The two teachers communicated throughout the process. At the end of the unit, Larry thought there were some areas that the students did not understand. He shared that information with Jim. Therefore, when Jim introduced the topic, he focused on those areas that the students did not understand in the computer applications class. For example, when the time period was a fraction, the students did not understand how the fraction was converted to a decimal. So, Jim made sure that he put several fractions into the problems the students were to complete. Jim addressed what the weaknesses were after Larry had introduced the topic.

Jim and Larry believed that this approach was successful. They openly shared information. They met several times throughout the year, mostly on an informal basis in the teacher's lounge, in the hallway, at lunch, or before and after school in their classrooms. They agreed that Larry would be the introducer on this project and Jim would be the reviewer. Further, Jim actually used Larry's teacher's manual to provide some of the same examples Larry had used previously. Jim and Larry agreed that the students' skills on calculating interest improved after approaching instruction as a team. In fact, test scores showed that students' skills in calculating interest related problems improved by 70%.

Discussion Questions

1. How difficult is it for teachers to plan integration activities on an informal basis? What are some barriers?

2. What was the key to Jim and Larry working successfully together on this integration activity?

3. What learning approaches are Jim and Larry using in their teaching that seem to benefit their students?

4. How often do teachers visit with one another to share instructional strategies? Give reasons why they do not visit with one another.

5. How did Jim and Larry overcome some of the barriers that prevent integration? Discuss other approaches they may have taken.

6. What can Jim and Larry do to assure their integration activities will continue in the future?

Case Study 27
Letter Writing in the Auto Mechanics Lab

Joe Carter, the auto mechanics teacher at High Plains High School, was desperately looking for a nontraditional method of reviewing a lesson on safety. The safety unit was long; Joe was getting tired of reviewing safety procedures; and it was about time to start testing the students on the unit. Because Joe had held a position as a shop manager for an auto dealer prior to his teaching career, he emphasized throughout the unit the importance of students applying the safety procedures they had learned in real-life situations.

After much thought, Joe came up with the idea of assigning teams of students to write a business letter taking the role of an insurance company representative who had found safety violations in an auto mechanics business. Joe felt that this would be an excellent review for the safety unit, however, he had one problem with the assignment. He did not know very much about writing business letters. Joe kept wondering how he was going to teach the students to do something that he knew very little about.

The more Joe thought about the letter writing assignment, the more excited he became. However, he knew he needed help with the assignment. So Joe went to the English Department to ask one of the teachers, Lisa Jones, for her help. He had met the English teachers the previous summer during a curriculum writing institute so he knew which teacher he wanted to talk with. In addition, Lisa knew Joe well enough so that he could get straight answers from her.

Lisa was helpful to Joe. She gave him a book on letter writing, and she reviewed with him the standard format for writing a business letter. Lisa also explained to Joe how she taught letter writing to her students.

After reviewing the materials Lisa had shared with him, Joe assigned teams of students to write a business letter as a representative of an insurance company. In the letter, the students were asked to outline the safety violations in an auto mechanics business and then summarize how to remedy the violations. The safety violations had to be real-world problems. In addition, Joe asked the students to write about hazards that might be extraordinarily dangerous.

Joe thought that the assignment would work well because it would provide an opportunity to find out what the students knew without making them take a test. It also gave the students a chance to review the safety materials. Joe assigned the students to work in groups of four to five. He believed this would help the students because they would be able to sit and discuss the safety issues as a team.

During the assignment, there was a lot of information interchanged among the students. The students discovered that they could write business letters. They also learned that nothing serious was going to happen to them if they misspelled a word or did not use the proper punctuation in their draft letters. In addition, they were successful at working together in groups. Joe felt that this was important because assignments in the auto mechanics lab require students to work together repairing cars. Further, when students enter the work world, they know they will find themselves working with others.

After the students finished writing the rough drafts of the letters, Joe asked Lisa to review them for grammar while he reviewed them for content. Lisa was more than happy to help Joe by reviewing the letters. This surprised Joe. He thought Lisa would think the review of letters was another burden on her busy teaching schedule.

After the students revised their letters, Joe graded and returned them. He encouraged the students to revise them again as needed and advised them that the English teachers had agreed to accept their revised letters for extra credit. But none of the students submitted the letters to the English teachers. Joe kept after them for a long time, but they would not revise and turn in their letters for extra credit.

Joe later told his principal, Larry Graz, that the writing task was one of the best assignments he had ever made. He noted that the assignment opened up a number of what he called "teachable moments." For example, a group of students wrote a letter citing a worker's smoking marijuana on the job. Joe was then able to discuss the implications of drug use in the workplace.

Discussion Questions

1. What benefits did Joe's students gain through the letter writing assignment on safety that would not be developed through Joe's traditional way of teaching safety?

2. After Joe made the arrangements for the auto mechanics students to receive extra credit for the letter writing assignment in their English classes, none of the students submitted their work. What are some teaching strategies that might motivate these students to submit their work for extra credit in English?

3. Joe knew he needed help teaching the students how to write business letters so he asked Lisa, an English teacher, to assist him. What are other resources Joe might have used to help him feel more comfortable teaching letter writing?

4. What did Lisa gain from working with Joe on the letter writing assignment?

5. How might student use of computers be integrated into this activity?

6. Joe was looking for nontraditional ways of testing the students about safety procedures and he chose letter writing. What are some other nontraditional strategies Joe might have used that involve vocational and academic integration?

7. In what ways might Joe assist Lisa in integrating some of the English content that she teaches?

Case Study 28

Mathematics in the Pre-Engineering Laboratory

Glen Lewis, a mathematics instructor, came to the Bluetown Technical Center three years ago. He did not know anything about vocational education. In addition, the Center had never employed a full-time, in-house mathematics instructor before.

The first year Glen was at the Center, he began a project that involved team teaching with two vocational instructors in the pre-engineering course. The class met three periods a day. Glen was assigned to assist the vocational instructors in teaching the students mathematical skills.

One of the pre-engineering instructors, Sylvia Mace, was teaching a unit on scale drawings for surveys the students were doing. Glen noticed that the students were having trouble calculating the scales and computing angles for survey triangulations. Sylvia agreed with Glen that the students were having difficulty with these calculations.

Glen thought of himself as a support person that was in the pre-engineering course to assist students in understanding basic mathematical information. Sylvia admitted that she did not have the mathematical expertise to teach the skills these students needed. Glen jumped right in to teach the students the mathematical skills necessary for them to complete the unit. Glen was excited because he felt needed. He commented, "Sylvia and I put our heads together. We were real flexible in planning the needed instruction. If a problem came up and we needed to deal with it, we would take the time to work on it."

The organization of the class worked very well. After Glen provided the basic instruction, he would then work with the students during the last two periods while they were doing their actual scale drawings. Once the students computed the scales in an applied situation, it became second nature to them. Glen circulated throughout the room to assist the students with their calculations.

Glen noted, "The students thought of the mathematical skills as just a part of what they were doing. I felt particularly good because I was able to help the students with an actual application of advanced mathematics. I became a part of all this madness they were doing. A lot of people feel inadequate and afraid of teaching technical math. This situation gave me an opportunity to explain the use of math skills in a practical mode."

Discussion Questions

1. How might the question of "turf" be an issue in this situation? Can battles over turf be avoided?

2. Glen appeared to be very excited about working with vocational teachers in their laboratories. How might more team collaboration and teaching be encouraged between vocational and academic instructors?

3. What are some of the more common basic skills that academic teachers might assist vocational instructors in teaching to their students?

4. What are three basic academic skills that academic teachers might assist vocational teachers in teaching their students. Give an example of how vocational teachers could teach each skill.

5. What can be done to assure the continuance of team collaboration and teaching so teachers do not go back to their old ways of teaching?

Case Study 29

The Community Can Be a Valuable Resource

John Westfall, an English teacher at Glenwood High School, had several vocational students in one of his eleventh grade classes. He decided to look into assigning students to write research papers dealing with the vocational areas they were currently studying.

To prepare for the vocational research paper assignment, John met with the business teachers to solicit advice on making the assignment. The interviews with the business teachers were positive. John incorporated a number of the business teachers' ideas into his assignment. John assigned all students (vocational and academic) to prepare research papers that dealt with their vocational areas of interest.

John and the business teachers met on an almost weekly basis for an entire semester to discuss progress on the assignment. They soon realized that the library did not have up-to-date resources (books and pamphlets) for the students to use. The high school did have some computerized information but there was not enough available to prepare a paper. John felt very frustrated about the situation because Glenwood High School is located in the largest city in the state, and he felt materials about the different vocations should be available and up-to-date.

John and the business teachers decided to contact people in the community to ask them to provide information to students. The feedback from the community was not rapid. By the time the papers were due, John and the business teachers had not heard from all the people in the community. Unfortunately, the students who were involved did not take the time to call the employers themselves or to go to the businesses. John had assumed that because these were the vocations the students were interested in pursuing, they would jump in to find relevant information. But they did not. John noticed that some of the vocational students did not take the initiative to search for materials like the academic students. He felt that the vocational students needed to learn these skills.

John now realizes that he and the business teachers will have to plan this assignment a little better. They felt that the problem was not finding the vocations in the community, but that they had not helped the students learn how to properly approach the businesses for the information needed. John commented, "The business teachers and I will interact more with the employers the next time we make this assignment. Further, we will prepare the students to get information they need from business people. Also, next year I am going to try to work with more teachers, perhaps science and health occupation teachers, to expand the extent of interaction between the students and people in the world of work they are preparing for."

Discussion Questions

1. What types of skills do students need to seek out information from the community?

2. What approaches might be used to motivate students to become more involved with the community?

3. How might John work with science and health occupation teachers on a similar project?

4. What are some strategies that John and the business teachers might use in the future to work with businesses in soliciting information on vocations?

Case Study 30
Diabetics in the Classroom

Jan Roe teaches math at Castle Rock, a large suburban comprehensive high school in the southeastern region of the United States. She got a new teaching idea from reading her professional math magazine one day. The idea was to work with a health occupations teacher and class to provide a realistic example of how diabetics take care of themselves. Karl Smith, a health occupations teacher, and Jan talked about how to present this information to a class using one of the diabetic students.

Jan and Karl decided to use an integrated activity to study diabetes. Karl helped Jan design classroom activities to teach the math students about diabetes and how to use math calculations as a diabetic. Jan had some students in math class that had already studied diabetes in health occupations. When she presented the diabetic material to her class, the students who had already studied the subject got really excited. Jan capitalized on their knowledge from the health occupations class. Students were teaching one another about diabetes.

Then, a diabetic student actually showed the other students how she measured her blood sugar and how math was a part of the monitoring process. For example, she showed the students how she tested her blood, how to give herself injections, and how she recorded numerical data from the testing.

After the class was over, students were talking to everyone at school about what they had learned. Karl believed this activity was successful because his students knew the background information on diabetics, and they were eager to present the material to the other students. The health occupations students were proud that they were part of the health occupations classes, and they wanted to tell others what they had learned. Jan commented, "Now if there are any health-related issues in my professional magazines, I go to the health occupations teacher and ask him if he can help me teach the activity."

Discussion Questions

1. What are the benefits of learning about diabetes through doing instead of just reading?

2. What enabled this application approach to work?

3. What other activities might math and health occupations teachers plan together?

4. How might Jan and Karl work together in the future to plan a teaching activity? What are some common barriers to teachers working together that Jan and Karl might encounter?

5. Why should teachers take advantage of knowledge students have to enhance instruction in their classes?

Case Study 31
Interviewing Skills

This past year, teachers working with the Business Academy at Green High School wanted to work with their students on developing interviewing skills. After many discussions among the academy teachers, the decision was made that the business teachers and math teachers would work cooperatively on this project.

The business teachers gave each of the math teachers a checklist stating the interviewing skills business teachers were helping the students build and what they wanted the students to achieve. For example, the business teachers explained to the math teachers what was meant by body language and how to read it, since body language was one of the skill areas the business teachers were trying to build. The math teachers were assigned the responsibility for conducting the interviews.

In addition, the teachers decided that the math teachers would assign the students interview grades and count those grades for both the math and business classes that day. One of the math teachers, Angela Gray, commented, "The students were very uneasy with me giving them grades for the interviews." She felt the students were not comfortable with these grades being assigned for both their business and math classes.

Angela also felt part of the problem was that students were not informed prior to the interviews that she would be assigning the grades. The students' levels of frustration were extremely high. Angela admitted that the problem was not entirely the grades, but they were part of it. She also believed that sometimes teachers make decisions and do not inform the students of the outcomes.

On the day of the interviews, the students were upset that Angela took the interviewing so seriously. She believed that the majority of the students were upset because she was evaluating them on interviewing skills even though she did not teach them the skills. The interviewing took the whole class period. At the end of the class period, Angela said to the students, "You will be graded on your interview skills for this class even though they are not math."

When the other math teachers took the interview evaluation sheets back to the business teachers, they had the same experience as Angela. In fact, students continued to complain about the interviewing process and the grade assignments. The business and math teachers were also frustrated with the outcome of this activity.

Discussion Questions

1. To what extent were the teachers' expectations for the cooperative effort fulfilled?
2. What would be more effective approaches for the business and math teachers to use when working together to build students' interviewing skills?
3. How might these teachers have involved students in the grading process so that students did not feel frustrated?
4. What were the primary weaknesses of this cooperative teaching effort?
5. How should grades be assigned for projects completed for more than one teacher?

Case Study 32

Teaching Writing Skills to Horticulture Students

Jesse Cotrill has been teaching English at Grass Peak Comprehensive High School for ten years. About four years ago, Jesse asked Fred Whalen, the horticulture teacher, to work with him in assigning horticulture students to write 20-page comprehensive technical reports on their laboratory area for English class. Jesse felt he and Fred could work as a team to make the horticulture students more aware that English is more than just English class. The idea was that English is an extension of the horticulture laboratory experience, and the horticulture laboratory experience is an extension of English.

Jesse and Fred believed that these students needed to have reading, writing, math, and oral communication skills. These are important skills in the horticulture laboratory and the workplace. For example, students must write legibly to fill out an order form or a receipt, and they need math skills to calculate costs.

Over the years, Jesse and Fred have worked out a fairly good process for their students to follow. The horticulture students are assigned to choose topics for their research reports and have them approved by Jesse. Fred gives the students relevant laboratory literature, and Jesse allocates time in English class for the students to visit the library and research the topic. Jesse also lets the students come to the horticulture laboratory during English class to use Fred's books.

Jesse and Fred also work together to grade the reports. When students finish their reports, Jesse assigns a grade. Then he sends the papers to Fred for critique. Jesse and Fred have been making this joint assignment for four years and they feel it has been extremely successful.

Jesse believed that this assignment was going to be more of a hassle for him because instead of having a classroom of students over whom he was in direct control, now he has to send them to the library or laboratory and he loses a little bit of control. Also, Jesse now finds that he sometimes grades reports on topics unfamiliar to him.

Jesse thinks that he is naturally critical of the technical report assignment. Even after using the assignment for four years, he doesn't feel it is what he would like it to be.

Sometimes, he thinks the students' reports are a little too simple, and other times he thinks they really do a great job.

Discussion Questions

1. What are some teaching strategies that Jesse and Fred might use to improve the technical report writing assignment?

2. What concerns do students have when teachers give them joint assignments?

3. Communication between teachers appears to be a major concern when making joint assignments. What are some communication strategies Jesse and Fred might implement so the joint assignment will be less of a hassle?

4. Why might Jesse feel concerned about giving the horticulture-related writing assignment instead of the one he would traditionally give?

Case Study 33

A Science Teacher Learns about Computers

As a science teacher at tiny Rural Advance High School, Sarah Stafford is beginning to use computers in the laboratories to solve a lot of problems. One of the courses she teaches is applied physics, and most of her students in this course are also studying business. It makes sense to Sarah that the students enrolled in applied physics should utilize their computer skills as a part of their physics studies.

Last summer all the teachers at Rural Advance High attended a curriculum writing institute. At the institute, Sarah told Curt Gray, the computer laboratory teacher, about her plans to better utilize the students' computer skills in her applied physics course. Curt replied, "Well, that's what I teach. Why don't I come in and help you out with that." Curt knew exactly what Sarah wanted to do and he was excited about helping. Drawing from past experiences, Sarah believed that when a guest speaker teaches the class, the students believe this speaker more than the regular teacher.

Curt and Sarah set a time when he was to teach the applied physics class. Sarah believed that setting a specific time was especially important because all too often teachers talk about a new project but fail to carry their plans forward. Next, the two teachers met to coordinate the lesson. Curt shared his handouts with Sarah. And Sarah gave Curt some examples of problems that were provided in the temperature conversions unit the students were currently studying. Sarah also gave Curt the correct answers to the sample problems.

When Curt taught the class, it went great. The students learned about spread-sheets and spent some time on the word processor. Sarah was up-front with the students. She told them that she didn't know how to do this activity and that they were all going to learn together. She thought that it was especially effective for the students to see their teacher going through the learning process with them.

Sarah doesn't think that all teachers are comfortable learning with their students. For example, some teachers will buy a new piece of equipment and keep it in the corner until they get time to learn about it. Sarah prefers to throw away the lesson plans for a day and get out that new piece of equipment. She likes to sit down with the students and try to figure out how the equipment works.

Sarah and Curt felt that the temperature conversion lesson was very effective. Since that time, the students have been applying the information that they learned to other learning settings. The two teachers plan to work together again in the near future.

Discussion Questions

1. Why did this instructional strategy work?
2. What are some of the teacher attributes and skills that contributed to the strategy's success?
3. Because computer technology is progressing rapidly, it is difficult for teachers to stay current. In addition to what Sarah did to learn about computers, what are some other ways that teachers can comfortably learn lessons with their students?
4. Sarah believes that it was important to establish a common time for teachers to meet and plan. Given that some teachers have hectic schedules, how might teachers get together to plan common teaching activities?
5. What are some examples of other lessons that Sarah and Curt might plan to team teach?

Case Study 34
Anxiety in the Computer Laboratory

Sue Rakes is a second-year English teacher at Whitesville High School. When she started teaching, she was planning to teach her students word processing skills for the first time. Frankly, Sue did not feel comfortable teaching the software. She was apprehensive because she feared the students would recognize that she did not possess the very skills she was planning to teach them.

At lunch one day, Sue discussed her apprehension with the computer laboratory teacher, John Katz. John recognized Sue's anxiety and offered to be present to assist her with the word processing instruction. Sue gratefully accepted the offer.

On the day of the initial word processing instruction, Sue and John decided to present the material to the students in the computer laboratory. First, John presented instructions about the software to the students. Sue knew how to use the software package, but she was afraid the students would ask her questions that she would not know how to answer. John assured Sue that he would be in the room to answer the students' questions. Sue felt more confident having John in the room to answer the questions.

By the third period that day, Sue added comments during John's instruction. John and Sue started switching roles. John backed off and let Sue take the lead in presenting the material. When something came up during the instruction that John knew the students were going to have trouble with, he would interject and help them get through the experience. By the afternoon, Sue was presenting the material on her own. She even remembered the points that were going to be problem areas.

Sue enjoyed the fact that John was still in the classroom during the afternoon. He was serving as the facilitator and helping the students individually. John felt that academic teachers were not used to having students work at different levels. He helped Sue get through the process of having a lot going on in the laboratory at different levels. John felt that if he had not been in the classroom to help Sue, students might have been confused during the instruction.

Sue has been using the computer laboratory to help her students with word processing assignments for the last two years and is accustomed to working in a laboratory environment. John commented, "I knew how to teach in a laboratory setting, but Sue had to feel comfortable in allowing for the appropriate learning to take place in the laboratory."

She is no longer hesitant about teaching in the computer laboratory and would like to teach in the laboratory more often. Sue and John created a schedule to teach in the laboratory so the students can compose a letter of application and write a research paper on the computers. Sue encourages other academic teachers to utilize the computer laboratory. John commented, "I feel as if Sue was successful because there was a change of behavior in teaching that was for the benefit of the students."

Discussion Questions

1. What was the key to Sue and John working together in the computer laboratory to teach the English students word processing skills?

2. How often do teachers feel anxiety about teaching an unfamiliar subject such as word processing because they don't feel they have time to master the skill?

3. Is it common for academic teachers to feel uncomfortable when teaching in a laboratory setting?

4. Can you think of other instances when vocational and academic teachers might "switch roles"?

Case Study 35
Don't Say Trigonometry

The principles of technology teacher, Jim Simpson, started teaching a course at Jefferson Senior High this year called Introduction to Engineering. This course is taught via simulations or computers and covers the basic elements of engineering.

Jim had recently talked to the math teachers at the school about algebra problems and he discovered that he was not presenting the correct material to students. The math teachers gave Jim some ideas about how to present the theories in his classroom. Jim asked the math teachers to share strategies for teaching trigonometry.

When teaching the unit on trigonometry, Jim used kites. He included the construction and production of kites. The underlying principles related to the construction and production of kites include math and science theories. The scientific principles involved everything from Bernouilli's Principle and aerodynamics to wind velocity. Even though this course was designed for junior and senior students, approximately 50% of the students in the class had not completed any math classes beyond basic algebra.

Jim assigned the students the task of calculating how high in the air they would be flying their kites. He provided the students with procedures for determining this calculation. What Jim did not tell the students was that they were using trigonometry. About a week into the unit, students began using Jim's procedures for determining how high the kites were flying. He had one student come to him and say that he did not understand the procedures. One of the other students said, "Well, it is just simple trigonometry." This student and probably ten others became very upset and said they could not do trigonometry. They said they never had a trigonometry course, and they stopped their work on the exercise focusing on determining how high the kites were flying.

Even after three successful days working on the project, Jim felt the students had the perception that they could not work with trigonometry. He helped them see that only then did they decide they could not understand trigonometry. Jim tried to counsel the students on an individual basis. He told them that there was no reason for them not to continue doing the problems related to flying their kites. He helped the students understand they could solve the problems.

If Jim had to do this assignment over again, he decided that he would tell the students up-front that they would be doing trigonometry and then make some presentations related to the theory. Jim said he would emphasize that doing trigonometry would not be threatening, and he would help students with any problems that they might encounter. He had a number of students master the principles of trigonometry even though they were unaware of the content. These students were surprised that they had performed a direct application of trigonometry so easily.

Discussion Questions

1. To what extent was this really an integrated, instructional activity? How might the activity have been changed to make it more integrated?

2. What are some other approaches that might be used to teach various subjects through application?

3. What does this case communicate about the possible advantages and limitations of teaching students application before they are taught theory?

4. What are some approaches teachers might take to help students feel more comfortable learning about perceived difficult subjects?

Case Study 36

Parasites in the Fish Tanks

Princeville High School received funds last school year to build a green house and purchase tanks to stock fish. John Price, the agriculture teacher at Princeville, stocked the fish tanks with catfish and trout. By October, four agriculture students had chosen the operation of the fish tanks as their class project.

Due to ammonia buildup created by overstocking the tanks and improper water temperature, the fish became stressed. That stress led to an outbreak of a fish parasite known as ick. Once John and the four agriculture students realized that the fish were stressed, they transferred the fish into new water.

At that point, John asked two science teachers, Beth Hays and Cathy Muth, if they would like their students to be involved with identifying the parasite involved and applying treatment. Beth and Cathy agreed that the activity would be beneficial to their students so the agriculture students and the science students began to work together on the activity. They spent two laboratory days identifying and treating the parasite. Beth and Cathy were excited about working with John on this project. Beth was very cautious and reserved because her science students were a little nervous about experiencing a new technology. John commented, "I think Beth is a little nervous because of the unknown."

A technician from the local fish hatchery, Roy Dobbins, was contacted and agreed to assist the students with the project. Roy spent two days at the school assisting with analyzing the problem and instructing students on microscope use. During his first day at the school, Roy helped the students review the potential problems. Roy also showed students what different parasites looked like using some of the fish he brought with him that had known parasite populations.

The second day was devoted to actual hands-on laboratory work consisting of catching the fish and determining which fish were infected and which fish were not infected. The students liked the roles they assumed in the decision process. Actually, the four agriculture students, who had ownership in the fish project, made the final decision for the group based upon scientific data gathered. Cathy commented, "We need to do more of these joint activities that allow the students to apply their knowledge in a practical setting."

It was easy for the students to see the application of scientific principles instead of just looking at slides under a microscope. In this activity, students were able to identify a real problem and then solve the problem. John overheard the students comment that they were fascinated with the movement of the parasites under the microscope and liked being able to handle the fish.

The solution to the parasite problem was treating one of the tanks with copper sulfate. The second tank did not have enough parasites, so it did not require treatment. Even more important, John is planning to expand on this program next year and involve additional students and people from the community.

Discussion Questions

1. What contributed to making this activity work?
2. Why might a science teacher feel uneasy participating in the exercise to identify and treat a fish parasite.
3. What other community people might be of assistance in teaching students relevant agriculture skills? List resources in your community to assist with agriculture and science projects.
4. How might John expand this program next year?
5. How might Beth and Cathy actively involve John in their science instruction?

Group IV
Administrative Practices and Procedures

The "Administrative Practices and Procedures" theme focuses on activities typically performed by administrators that enhance the integration of vocational and academic education. Administrative practices and procedures include (1) facilitating the integration process through team building and teacher empowerment, (2) communicating and assisting with scheduling and organization, and (3) supporting the integration process through effective leadership.

Case Study 37

What We Have Here Is a Communication Problem

When Luke Hudson began his new job as principal of McKinley High School five years ago, he was immediately impressed by the faculty members' dedication and professionalism. Teachers and counselors would take initiative to help students, regardless of how much time was required. They literally "went the extra mile." And since Luke's assistant principals, Hazel Washington and Hector Garcia, were extremely competent, everything made the job of principal just that much easier and more enjoyable. Luke considered himself a people person and a good communicator, so he could quickly see that the climate at McKinley High was ideal for him to provide meaningful leadership.

Luke was quite pleased last year when his superintendent, Mary Mack, asked him if McKinley High would serve as the pilot school in the district to integrate vocational and academic education. The request confirmed what he had thought all along, that he was doing a fine job as principal. So Luke naturally agreed to initiate the integration process and was confident that the integration process would be complete in 24 months or less.

Luke first set up regular planning meetings with Hazel and Hector. At these meetings they began to identify the teaching areas that would be integrated first, which teachers would work together, and what curriculum and instructional changes would take place. After a month of planning, Luke, Hazel, and Hector began implementing changes. They did so by talking with the persons that would be directly involved, discussing what involvement each person would have, and describing what should be done.

Everything seemed to be progressing well until the school secretaries began asking Luke questions. They wanted to know what was going on with "this integration of academic and vocational subjects" because many teachers were coming to them asking about it. The teachers who were asking the questions were the ones who were not involved in the integration process; they clearly wanted to find out what integration was all about and how it would affect them. Luke called an emergency session with Hazel and Hector. What was the problem? Had they done anything wrong? All of a sudden, Luke blurted out, "I could kick myself! I really underestimated the need to communicate with all the teachers and counselors in the school." Hazel and Hector agreed. The three of them had forgotten to involve the entire faculty and staff in the integration process.

Discussion Questions

1. What effect might the integration plan Luke decided to follow have on enabling faculty members to work as a team?

2. What are the advantages and disadvantages of working with a small group of faculty members before including the entire faculty in curriculum integration?

3. If you were a teacher or counselor who had not been included in the integration process, how would you feel? What sort of support might you give to future changes at McKinley High?

4. In addition to communication, what planning should have occurred to avoid the way integration of vocational and academic education was introduced at McKinley High?

5. Given the situation he created, how might Luke deal with the problems and move toward successful integration?

6. What may have occurred if teachers and counselors at McKinley were given an opportunity at the beginning to design the integration process?

Case Study 38

If at First You Don't Succeed

"All systems were go" to integrate vocational and academic education at Rangeline High School. Prior to the start of the school year, school principal Reba McKenzie organized a very creative and successful inservice education program for all of Rangeline High's 42 teachers and counselors. Because of this success, almost everyone was getting excited about the prospect of integration.

At the school's first fall faculty meeting, Reba gave everyone a motivational talk about integration. In her talk she emphasized the need to work toward full integration on a day-to-day and week-to-week basis. Integration was not something that a teacher did once each year or semester. Instead, it worked best when teachers worked together to integrate content and team teach across subjects. She concluded her talk by asking each teacher and counselor to work as hard as he or she could to move in the direction of total integration. Reba asked the staff to share with her progress made and to identify areas where assistance was needed.

As the fall semester progressed, Reba noted that teachers and counselors were making very little progress with integration. Discussions with individuals revealed that time was at a premium and that after completing required work assignments such as performing lunch room duty, getting grades in on time, and selling tickets to the football games, integration was not a high priority. Toward the end of the semester, a delegation of vocational and academic teachers and counselors asked to meet with Reba. At their meeting, George Steffan, a math teacher and co-spokesperson for the group, said that the vocational and academic teachers and counselors needed to work together as teams if they ever hoped to integrate vocational and academic education. George then proceeded to outline a plan of action the group hoped would ensure success He said that integrating on an individual basis was not worth the effort since it did not result in significant long-term improvements. The faculty should, instead, work as teams. This could begin by faculty members meeting as a group and learning how to create functional teams.

Alice Adams, an electronics teacher and co-spokesperson, then continued the discussion. "Faculty members," she said, "should be given a common time to meet as teams and plan for integration. This must not be at the end of the school day when everyone is worn out and wants to get home." Alice concluded that, "because the high school campus is quite spread out, just the physical act of faculty members getting together and talking about specific integration activities forces them to work together and makes the group more cohesive."

Reba was rather upset with herself since she had not been very successful at meeting faculty members' needs. But she vowed that she would do everything possible to make integration work at Rangeline High. Between the fall and spring semesters, an all-day meeting for the entire faculty was held at the school district central office. Central office staff members experienced in team-building processes led a workshop focusing on ways faculty members could work together to achieve integration. At the conclusion of the workshop, Reba announced to all present that "money has been made available so teacher aides will cover all lunch duty assignments. Now faculty team members will have a common time during lunch when they can meet and plan integrated instruction. Next year, teacher teams will be assigned common planning periods so they can work together." The entire faculty applauded.

Discussion Questions

1. What might have happened if Reba had not moved swiftly to meet faculty members' integration needs?

2. Why are team integration activities more meaningful than integration activities conducted by individual teachers?

3. What does this case communicate about teacher empowerment and team building as strategies for achieving integration?

4. Why is it so important for faculty teams to have a common time when they can meet and plan for integration?

Case Study 39
Dealing with the Skeptics

When Janet Hollins applied for the Oakmont High School principalship, she knew the competition would be stiff. But she also recognized that her professional experience would make her very competitive for the position. In addition to serving for nine years as a high school business education teacher, for the past four years, Janet had been principal of Carver Technical Center. Since both Oakmont and Carver were in the same school district, she had worked successfully with many Oakmont administrators, teachers, counselors, and students. Each year, over 200 Oakmont students enrolled in vocational and technical courses at Carver. So it came as no great surprise when Janet was offered and accepted the Oakmont principalship.

Located in the southeastern part of a large metropolitan area, Oakmont High at one time served students from upper middle class homes. However, over the last 20 years, more and more students that the school serves have special needs and come from lower middle class, single-parent families. Last year, about 60% of the 1,200 Oakmont students received free or reduced cost lunches. In terms of further studies, 50% of the Oakmont graduates went on to some form of higher or continuing education.

Janet realized that her new job would be difficult since she felt the need to reverse the trend toward greater numbers of school dropouts and fewer students passing the mandated state basic skills competency exam. To improve the quality and relevance of instruction at Oakmont, Janet's basic plan was to build teachers of vocational and academic subjects into a powerful professional team that would focus on the integration of vocational and academic education. The shift to integrated education would probably take two to three years, but Janet believed faculty members would notice some improvements even sooner.

What Janet did not realize as she began to implement her integration plan was the great division that existed between Oakmont's vocational and academic teachers. Virtually none of the vocational teachers communicated with academic teachers; it was as if there were two different schools. Even more disconcerting, when Janet began working at Oakmont, she sensed that many of the academic teachers were skeptical about her credentials to be principal since she had a vocational teaching and administrator background. When Janet started talking to teachers about applied subjects and how to better meet the needs of all students, some of the academic teachers began to feel that Oakmont was going to become a vocational high school. A few of the teachers who had been at Oakmont for a number of years wanted Janet to get the school attendance boundaries changed so the types of students that had attended Oakmont 20 years ago could be taught again. As Janet moved ahead with her plan to integrate vocational and academic subjects, she could sense that teacher resistance to the plan was building.

Now, two years after she began her tenure as principal, Janet is quite pleased with the progress made toward comprehensive integration. She freely admits her mistakes indicating "if I had it to do over again, I would have taken a different approach. At the beginning, I would have talked with all teachers in the school more about changing how we teach, learning and learning styles, and modifying how instruction is delivered by both vocational and academic teachers. If the task were approached in this way, I might not have had to spend as much time legitimizing vocational education in the eyes of academic teachers."

Discussion Questions

1. Why did some teachers at Oakmont High resist change to the status quo? What can be done to help these teachers accept change?

2. What are some of the reasons why vocational and academic teachers resist working with each other? How can teachers and administrators help reduce or eliminate this resistance?

3. How can teachers be helped in changing their attitudes toward students in the school?

4. Why is it important to have teachers work as teams in the integration of vocational and academic education? How might some of the teachers at Oakmont High have helped Janet to go forward with the team building process?

5. How might Janet create a climate early on where vocational and academic teachers feel comfortable working together as teams?

Case Study 40
Promises Never Kept

Sara Stone really enjoyed teaching horticulture at Greenburg Technical Center. The students in her classes were, with few exceptions, motivated to learn and seemed genuinely interested in the horticulture field. In fact, many of the students who graduated from her program took jobs in the horticulture field.

As a full-time center offering a range of technical and academic courses, Greenburg awards its own high school diploma. Over the years, Greenburg has had much success placing graduates in jobs related to their technical studies. But more recently, school administrators and teachers noted that more employers are looking for employees who have higher levels of proficiency in math, science, and English as well as technical subjects. So the Greenburg administrators decided, with the blessing of the Center's advisory committee, to shift from a departmental structure to a cluster structure. The change meant that math, science, English, and various technical subject departments would be dropped and, in their place, clusters would be formed with titles such as communication, transportation, and human services. About half of the faculty in each cluster would be teachers of technical subjects and about half teachers of academic subjects.

When Sara first heard about the reorganization, she began to be concerned about her job. Having taught at Greenburg for only five years, Sara knew that she would be among the first to go if a reduction in force occurred. But after her principal, Juanita Garcia, met with the faculty and explained that clusters would not cause reductions in faculty and clusters could contribute to the integration of technical and academic subjects and ultimately better prepare graduates for a world class workplace, Sara began to accept the change. What convinced Sara even more was Juanita's promise to have cluster faculty members meet to prepare a curriculum book that compiled what teachers believed was important for students to know and outline how the teachers would work together to deliver relevant instruction.

Sara and the other teachers in her cluster were excited when the time arrived to prepare the curriculum book. They spent many hours over a period of weeks working together to produce what they felt was an excellent document. Now, three months after the teachers completed the book and submitted it to the principal's office to be typed and copied, they have yet to hear one word about its status. Sara said, "I know teachers are still making comments about the curriculum book." Kevin Freedom, a member of the cluster who teaches English, grumbled, "Did I do all that work just to have it thrown in the trash can?" And Barbara Storch, a physics teacher, stated, "We teachers spent a lot of time preparing the curriculum book and never did get anything out of it."

Much of the initial faculty excitement about the cluster concept and curriculum integration has worn off. Several faculty clusters are now beginning to feel it is a waste of time to work on any long-term change if they are not going to get support for their efforts. As Sara put it, "As far as I know, nothing was done with our curriculum book notes. The book has never been distributed to the faculty and no one seems to know when it will be ready. Teachers are slowly shifting back to the way we were before the reorganization."

Discussion Questions

1. What are some possible concerns Juanita, the principal, might have about distributing the curriculum book? Why do you think she did not communicate her concerns to the teachers?

2. How did Sara's attitude toward curriculum change evolve over time? At what point was Sara most "sold" on the notion of integrating technical and academic subjects?

3. In what ways might Sara and the teachers in her cluster work together to discover what happened to the curriculum book they developed?

4. What are some of the risks associated with relying on one focal point, such as a curriculum book, to effect faculty attitudinal change toward curriculum integration?

5. If you were the principal of Greenburg Technical Center, what would you do to ensure that teachers in Sara's cluster continued to move toward integrated curriculum and instruction?

Case Study 41

Team Teaching: What Made It All Possible?

Could integration take place at a small rural high school? When Jim Bennett, the auto mechanics teacher at Trout County High School, first heard about vocational and academic teachers working together, he intuitively felt concerned. After all, except for the time when teachers formed committees and prepared for the school's accreditation, everyone seemed to do their own thing. Each teacher was, in effect, in charge of his or her classroom. This feeling of autonomy was important to Jim.

Sherry Parsons, Trout County High's physics teacher, was likewise concerned about the integration concept. She felt that the academic teachers she knew were already doing a good job preparing students for college with their instruction based directly on approved textbooks. Sherry perceived no need for change.

Trout County High School is located in the center of a rural county that had been traditionally dependent on agriculture and tourism but, over the past ten years, has been shifting to an industrial base. Several manufacturing firms have relocated to the county from the northeast and two high tech manufacturing firms established in the county by local people are thriving. Additionally, the county is currently a finalist for the location of assembly plants for two multinational firms. Trout County High serves 648 students in four grades and provides a range of vocational and academic courses to meet the needs of students who plan to attend college and those who choose to get jobs right after high school graduation.

Last fall, when the teacher inservice education days focused on integrating vocational and academic education at Trout County High, the teachers were understandably nervous. Jim was afraid that his automotive instruction would become watered down and less relevant. Sherry, on the other hand, was concerned that her control over what was taught could be drastically diminished. So, toward the end of the fall faculty meeting, when Jim and Sherry were assigned to be a two-person team that would look into the possibility of integrating physics and automotive instruction, they both just about bit their tongues.

At their initial team meeting, Jim and Sherry each started out protecting their course turf. But as the discussion continued, both Jim and Sherry began to realize that they shared much in common, particularly in respect to student motivation and course content. Their common concerns led them to explore the possibility of initiating an applied physics course for all students at Trout County High. Mabel Hawkins, principal of Trout County High, who was pushing for integration, was most supportive of the idea. She saw to it that Jim and Sherry received applied physics information and were given time to prepare a course syllabus and related instructional and assignment materials. Mabel was able to also secure funding so Jim and Sherry could attend a two-week workshop for teachers of applied physics courses.

Jim and Sherry learned a great deal at the workshop. In addition to finding out more about what applied physics was, they learned different ways that course content could be taught. Everything was presented so clearly and so well that Jim and Sherry were sure they could team teach an applied physics course at Trout County High.

So now, a little over a year since they first began working together, Jim and Sherry are team teaching an applied physics course at Trout County High. And how does Jim feel about this? Jim freely admits that "Mabel Hawkins is the one who gave us support and helped us to understand how important it is to integrate vocational and academic education. She got the funding for Sherry and me to attend the workshop and to purchase the equipment for the applied physics course." And as for Sherry, she comments that "we had to do a lot of work and quick learning to be able to carry out the course experiments successfully. And thanks to Mabel's assistance and our hard work, the effort has paid off. Students in the applied physics course really like the instruction. They are spreading the word about the course to other students and teachers. Also, the math and science teachers who teach near the applied physics lab are impressed by the equipment as well as what we are doing in the course."

Jim comments that "the applied physics course I team teach with Sherry has been so successful and so well received that the high school curriculum will soon include an applied math and an applied biology course. I wonder which teachers will be team teaching these courses."

Discussion Questions

1. Why was the establishment of a team taught applied physics course at Trout County High so successful?

2. How did Jim's and Sherry's attitudes toward integration evolve from the time they first heard about the concept to the time when they began team teaching? Were their initial attitudes typical of those held by most high school teachers?

3. What are some of the concerns that you might have about team teaching a course with a person from another subject area? How might these concerns be reduced or eliminated?

4. What might have happened if Mabel Hawkins had not provided support for Jim and Sherry to team teach the course?

5. Do you think Mabel had a long-range plan for integration or was she just reacting to needs as they arose?

Case Study 42

When Are They Really Going To Involve the Faculty?

Betty Barkley, Henderson County Assistant Superintendent for Vocational and Adult Education, wondered what had gone wrong with her plans to integrate vocational and academic education. She was sure she was well-qualified to provide leadership for the integration effort. In fact, Mark Denton, the Henderson County Superintendent of Schools, had hand-picked Betty for the assistant superintendent job because she had taught both academic and vocational subjects. Also, her five years as principal of Johnson High School just prior to becoming assistant superintendent allowed her to work with academic and vocational teachers on a daily basis.

As she thought about the integration problem, Betty recalled a time almost two years ago when the implementation began. It was then that she and the three high school and three vocational center principals met to decide how integration would be organized. Several possible organizational arrangements were suggested but through discussion the group narrowed them down to what was felt would work the best. The group decided to establish a pull-out model where students enrolled at the three vocational centers could complete their mathematics and English course requirements by being pulled out of their vocational education classes for a period each day to attend one of the academic classes offered there. Based on this decision, Betty requested that the county hire six new teachers—three in mathematics and three in English. The board approved the request and the new teachers began their teaching duties last fall.

She wanted to be sure the vocational teachers were involved in planning for integration, so she organized a week-long seminar for them just before the school year began. Betty recalled the first day of the seminar when she gave the vocational teachers information about the pull-out model and said to them "You have your English and math teachers. Now how are you going to use them?" Betty felt that the process was quite simple. The vocational teachers had the rest of the week to decide how the new teachers would be used in the pull-out model.

But now, seven months into the use of the model, Betty began to hear rumblings from faculty members. It was not very clear to her why some of the teachers were upset, but she could not tell how angry they really were until she overheard some comments one day in the faculty dining room at Hillsville Technical Center. Victor Vargas, the Hillsville math teacher, was discussing his concerns with Amy Cantrell, who taught English there. Victor said to Amy, "I guess the academic teacher positions were established at the vocational centers because of some big study the county did. The whole plan was laid on the teachers without allowing them to have any input or discussion." Victor went on to say that when he began teaching math at the center last fall, he "sensed a lot of resentment among the vocational teachers and there was a great deal of confusion." Amy agreed with Victor, saying that she had no guidance or support for her teaching and due to a lack of direction, tried to teach a traditional language arts course and somehow make it relevant. "So far," she concluded, "this was not happening."

Now very concerned about the situation, Betty sought advice from her former teaching colleague, Jackie Gerard, who taught electronics at South Branch Technical Center. After Betty described the situation, Jackie proceeded to give some rather blunt comments. "Well," said Jackie, "what did you expect? The teachers were never involved in the planning process from the start. The county had already decided that it would be a pull-out model with academic courses taught for some, but not all, of the students. Students at the centers were taken out of their vocational classes for different times to receive math and language arts instruction according to their individual course needs." "But I gave the teachers at each of the centers a full week to plan," replied Betty. Jackie continued, "You didn't hear what the teachers said when you stepped out during the second day of the planning seminar. There was real consensus among the teachers that everything had been decided and that planning takes much longer than a week. And, as for progress with the program," Jackie concluded, "Jay Schwartz, our new math teacher at South Branch, told me the other day that the pull-out model can only be 25% successful since the model allows him to only teach math to 25% of the students at the center."

Betty felt quite depressed and frustrated by the whole situation. She knew that she must get busy with "damage control" procedures before information about all this reached the superintendent's office.

Discussion Questions

1. When did the problem with integration begin to take shape? At that time, what might have been done to resolve the problem?

2. To what extent was Betty Barkley part of the problem and to what extent did she contribute to the solution?

3. Do you personally feel that teachers' concerns about the pull-out model were justified?

4. What is your reaction to Betty Barkley's idea to take care of things through damage control procedures? Under the circumstances, is this the best approach to deal with the problem?

5. If you were an administrator at one of the vocational centers, how would you feel about the current problem with the pull-out model? What would you do to resolve the situation and keep the problem from reappearing in the future?

Case Study 43

This Will Ruin Our School!

Maria Garcia was quite pleased to be the director of Casa Nueva Technical Center. After all, Casa Nueva had the best of everything. The Center enrolled over eleven hundred full-time high school students from all over Canyon County. Casa Nueva offered twenty-five different technical programs and its equipment and laboratories were among the best in the state. The teachers of technical and academic subjects all had bachelor's degrees and many also held master's degrees. Maria was especially proud of Casa Nueva's graduate placement rate. Over the past five years, more than 88% of the Center's graduates had been placed in jobs related to their technical preparation.

Maria was also pleased with the progress being made toward integrating technical and academic subjects. Although begun less than two months ago, implementation was moving along quite well. This school year began with a two-day workshop for all teachers that focused on what integration was and roles teachers had in the process. During the workshop, technical and academic teachers were given time to meet in technical cluster groups and discuss ways they could work together in planning for and providing integrated instruction. At the conclusion of the workshop, Maria told the teachers that their teaching schedules would be adjusted so they could meet in technical cluster groups to continue curriculum and instructional planning.

Based on integration success throughout the year, Maria announced at a spring faculty meeting that effective next school year the existing technical and academic subject departments would be disbanded in favor of the technical cluster groups that had been formed during the teacher workshop last fall. This meant there would be no departments of Mathematics, English, Science, Electronics and so forth. In their place, technical and academic teachers would become members of technical clusters such as Construction, Transportation, and Human Services.

So it came as no surprise that Maria was quite anxious to tell the Center's governing board members about the progress toward integration that was being made. Her report, which was on this evening's board meeting agenda, came right after comments made by Jason Fremont, a physics teacher who represented the Teacher's Association at the Center. As Maria listened, Jason said to the board that "integration is going to be the ruination of the Center. If students are kept in clusters, they will not be given an opportunity to socialize with other students. Additionally, the instruction will be watered down to a point where students don't learn much." He went on to say "I am so confident that reorganizing for integration will be bad for our students that I plan to file an official grievance with the board."

Discussion Questions

1. Why do you think Jason Fremont felt the way he did about integration at the Center?

2. How do you feel about the change from departments to clusters and how it might affect the students?

3. Would Jason's remarks influence the way you, if you were Maria, make your report to the board?

4. How could Maria have been unaware of the negative position taken by Jason? What implications does this have for communicating with faculty members on a regular basis?

5. In the long term, should Maria modify plans for integration at Casa Nueva or keep them as they are? What are the implications of changing integration plans after the process has begun?

Case Study 44
Organizing for Teacher Cooperation

Thanks to the efforts of Mike Early, principal of Fairmont Technical High School, the integration of vocational and academic education was off to a smooth start and appeared to be proceeding quite well. Mike felt that changes in the workplace were affecting the needs of business and industry and that it was time to prepare graduates who could compete for jobs with world class employers. Mike's strategy was simple. He began the school year by providing Fairmont faculty members with an orientation to integration and, later in the year, organized the faculty into occupational cluster groups. Each cluster, which included both vocational and academic faculty, focused on a different occupational area such as business and transportation. In this way, it was felt that math, science, English, and social studies teachers working more closely with vocational teachers in each cluster would be more inclined to cooperate with the integration process.

Since Mike knew that teachers needed to plan for integration, he set aside time in the school calendar each month so cluster faculty could meet and discuss integration efforts, problems, and ways to collaborate. He felt that once the cluster faculty started meeting, they would begin meeting informally and eventually plan joint integration projects and activities. At each monthly meeting, Mike kept the agenda focused on new ways to integrate and how to achieve success in the integration process.

It came as quite a surprise last week when Stan Forbes, one of Fairmont's most respected vocational teachers, wanted to meet with him and discuss problems with the integration process. When the meeting time arrived, Mike was already getting nervous and concerned about whether his plans had not worked out. He immediately asked Stan what problems existed. Stan began the discussion by talking about his personal experiences with integration. "Because of all the changes in the automobile industry, I could not get along without the help of the academic teachers," Stan said. He then commented, "I have talked to teachers from other schools that are not integrating and working in clusters like our school is and, quite frankly, I don't see how they can have an effective automotive program. Without the integration, my students would not receive [the] supporting skills and information they need."

Mike was feeling much better. Things were not as bad as he had anticipated. Stan continued, "I am really excited about the possibilities that exist if vocational and academic teachers will work together." And I have worked hard and taken a lot of my personal time to collaborate with math, science, and English teachers in our cluster." "However," he continued, "I don't feel that others are taking advantage of the avenues open for cooperation between vocational and academic faculty." Stan went on to say that the monthly cluster meetings were positive and he personally had been in touch with academic teachers at least weekly. "I feel as though my students sort of look to me as a role model," he said. "So I help the academic teachers with their discipline problems." "What we really need," Stan continued, "is for teachers to work together on integration on a daily and weekly basis. Relying on exchange of information among teachers at the monthly meetings is not enough, even as good as the meetings are."

Discussion Questions

1. According to Stan, what seemed to be the core problem with integration at Fairmont Technical High School? Based on Stan and Mike's discussion, do other potential problems exist at the school?

2. Why did Stan feel it was important to talk to Mike about the integration problem?

3. How might Stan's skills as a faculty leader be utilized to improve the integration process?

4. If you were the principal of Fairmont, what changes would you make to ensure that the faculty move ahead with integration in an efficient and effective manner?

5. How can administrators more effectively recognize the need for teachers to have opportunities to work together?

Case Study 45

Is There a Leader in the House?

When a group of vocational teachers and English teachers at Stanleyville High School were asked to meet together and discuss cooperative projects, most people were curious and some were upset. After all, it was just last year that the school had successfully completed an accreditation. "It seemed," thought Jack Hemlock, an English teacher, "that teachers had been exposed to enough cooperative efforts to last them for a long time."

With the five vocational teachers sitting at one side of the conference room table and the five English teachers sitting at the other side of the table, it looked as though Marcy McDougall, the Stanleyville principal, had her hands full. So Marcy proceeded slowly with the explanation of what she had in mind. Marcy first described the need for vocational and academic teachers to work together by citing the results of cognitive science research related to learning in context. She went on to discuss how vocational and academic education had the potential to help students who had different learning styles and those who are at risk of dropping out of school. Finally, Marcy issued a charge to the group. She indicated that the vocational and the English teachers would work together on projects designed to better prepare their students for further study and the work world. After a rather unsuccessful question and answer session, Marcy promised to help the group accomplish its goals in any way that she could. As the meeting adjourned, Jack Hemlock thought to himself, "Ms. McDougall said she would help us, but how do we know this is not just a lot of talk?"

Jack was quite surprised when the vocational and the English teachers elected him to coordinate the cooperative effort. Perhaps it was because of his experience as a welder prior to becoming an English teacher. At any rate, Jack knew that his full teaching load and current assignments as faculty sponsor for the school student council and as debate team coach would not allow much time to coordinate the integration. So he requested Marcy to either give him some release time from teaching responsibilities or assign an administrator to provide the group with needed leadership and support. Marcy said that she would look into the matter. After Jack returned to his office in the English department and began to document his request to Marcy in writing, he thought, "What if Ms. McDougall does not give me any release time from my classes or does not assign someone to help the group? How will this affect our progress?"

Now, four months later, Jack and Marcy were meeting again. This time, Jack almost got angry with Marcy but managed to keep his composure. "When the teachers first tried to develop cooperative projects between the English and the vocational classes, a real problem developed," Jack said. "Some teachers were doing the projects in their classes and some were not. I don't think the teachers thought the projects would actually be done. The English teachers took the projects more seriously, while some of the vocational teachers were less dedicated. As you know, I more or less served as the project coordinator even though I have a full teaching load and a number of other assignments. Also, I never had any authority over the cooperative effort. This has been your responsibility." Marcy, who was rapidly becoming quite uncomfortable, shook her head "yes," but remained silent.

Jack continued by saying, "The vocational teachers would come to me somewhat begrudgingly and rather angrily ask what they should be doing next. They would indicate that I was the one who should know all about the projects and what should be done. The English teachers had problems since some of their students came from various vocational classes, while others did not. Some students came to their vocational teachers with requests for information they needed for the projects in their English classes while others would not."

Jack began to raise his voice and talk faster. "Efforts to integrate among the English and vocational teachers are now at a standstill. No knowledgeable coordinator was ever assigned by your office to work with the teachers or follow up on the integration projects. Projects like this need someone in charge who is thoroughly grounded in the area. As teachers we have been shortchanged because no one has been assigned to work with the teachers, to see how the effort is progressing, and to check whether or not the students are coming to classes with needed information. All the teachers are now paying for the lack of project coordination. What are you going to do about it!"

Discussion Questions

1. If you were Marcy, how would you respond to Jack?

2. What factors contributed to the problems with the integration project?

3. To what extent do you feel Jack's contributions to the project could have been greater? How might Jack's initial attitude have had some effect on his project coordination duties?

4. If you were a teacher elected by other teachers to provide leadership for an integration project, would you function in the way Jack did or would you do some things differently?

5. If you were the principal of Stanleyville High School, what would you have done to maximize the success of the project?

6. Why is quality leadership so important to the success of integration? Describe some of the leader attributes that administrators and teachers should have if they expect to lead others in establishing quality integrated instruction in a school setting.

Case Study 46

A Heart-to-Heart Talk

Bonnie Brice, the new principal at Flatland Area High School, needed to talk to someone. Many things had gone well during her first year as Flatland principal, but the new integration project really bothered her. So Bonnie called Joyce Tompkins, a veteran principal at neighboring Blue Springs High School and arranged for a much needed heart-to-heart talk over lunch.

As Bonnie and Joyce ordered their lunch, the integration concerns at Flatland began to unfold. "Joyce," Bonnie said, "I just had to talk with you and get your feelings about a problem that has developed in our school. You see, last fall I was not thinking when I scheduled the Applied Communications teacher, Jack Kingman, to teach regular English classes. At the same time, I assigned the Applied Communications courses to a new teacher, Melonie March, and asked her to get the materials from Jack Kingman and talk to him about how to teach the courses. Well, Melonie didn't have any inservice preparation to teach Applied Communications and the way she has handled the courses turned out to be a disaster. Not only is Melonie doing a poor teaching job, but she has failed to coordinate her teaching with instruction provided by the vocational teachers."

"So, what do you think about all this?" asked Joyce. Bonnie continued, "It looks as if I destroyed the good feeling Jack Kingman had about Applied Communications through just one scheduling maneuver. I also embarrassed Melonie March by not providing her with inservice education for Applied Communications. It was like helping her to fail. Instead of functioning as a leader, I simply did not think. I should have spent more time to ensure that Jack and Melonie worked together as the school year progressed. "That's very interesting," said Joyce. "Also," said Bonnie, "I should have introduced Melonie to our vocational teachers and arranged for them to plan joint assignments together. Maybe I never should never have taken on the extra assignment as girls basketball coach. It seemed like a good idea at the time, but the coaching sure gets in the way of my principal duties. Do you have any suggestions?"

Drawing from her fifteen years as a successful and highly regarded high school principal, Joyce provided some sage advice. "On the surface," Joyce said, "scheduling Melonie to teach Applied Communications without adequate preparation involved only her and Jack Kingman. Yet I can see that a lot of ground was lost by not providing a smooth transition of the Applied Communication teaching responsibilities to Melonie. What you did not only affected Jack and Melonie but other English teachers and vocational teachers as well. Of course, don't forget the students in the Applied Communications courses. They were the real losers." Bonnie thought to herself, "I hope Joyce can give me some advice to get me out of this mess!"

Discussion Questions

1. What sort of leadership was Bonnie providing for her teachers during her first year as principal of Flatland Area High School?

2. In your opinion, what contributed to Bonnie's problem with the integration process? In what way is her problem typical of what can happen to new administrators?

3. How do you think Jack, Melonie, and the English and vocational teachers felt about the situation that Bonnie described? Based on their individual experiences with integration, to what extent might each of them support further integration activities?

4. If you were Joyce, what advice would you give to Bonnie?

5. What should be done in the future to ensure that integration problems do not resurface in the high school?

APPENDIX A

SELECTED BIBLIOGRAPHY FOR CASE STUDY INSTRUCTIONAL METHOD

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APPENDIX B

CHART OF CASES

GROUP I				COOPERATIVE EFFORTS
CASE	TITLE	TYPE OF SCHOOL(S)	TEACHING AREAS	DESCRIPTION
1	Let's Get Started	Comprehensive High School	English Librarian Vocational	In order to eliminate the general track, a career exploration activity which would focus on integrating vocational and academic education was implemented. Ninth graders performed research and interviews to learn about the requirements for various occupations. An oral presentation was given in English class.
2	Teachers Teaching Teachers: Can It Work?	High School Vocational/ Technical Center	English Business Cosmetology Welding	Reading- and writing-in-the-content-area strategies were presented as inservice sessions. The sessions were well-received at the high school, but were met with some hostility at the technical center. The vocational teachers said the examples given at the workshop did not relate to what they did in class.
3	Don't Step on My Toes	Magnet School for Technical Occupations	English Electronics Business Home Economics	The principal's announcement that vocational and academic teachers would form teams to align curriculum so student communication skills would be improved provoked negativity among most faculty. Many were resistant to change and several felt that they should have been involved in formulating the initial plan.
4	Commitment Makes the Difference	High Schools Vocational/ Technical Centers	Physics Mathematics Electronics	An interdisciplinary team attended a regional workshop on integration and developed plans for many integrated activities, using team teaching and class switching approaches. The integration activities were successful, and teachers were enthusiastic.
5	The Importance of Terminology	High School	Physical Science Machine Tool Operations	The vocational teacher and the science teacher planned a team teaching activity involving a demonstration of science concepts in the machine tools laboratory. The vocational teacher was intimidated because her terminology was less sophisticated than the academic teacher's.
6	Different Courses, Different Students, Different Teaching	Magnet School for Technical Occupations	Language Arts Math Science Instrumentation Technology	A new English teacher was assigned to a cluster comprised of a vocational, language arts, mathematics, and science teacher, as well as a guidance counselor. He learned about the vocational teaching role and he modified his own teaching to be more relevant to the world of work.

CASE	TITLE	TYPE OF SCHOOL(S)	TEACHING AREAS	DESCRIPTION
7	Shifting from "Us and Them" to "We"	Comprehensive High School	English Drafting Math	After a troubled start on a freshman project, "Navigating the Workplace," the media specialist complained to the principal that more preparatory planning was needed. A meeting among vocational and academic teachers was organized to develop step-by-step objectives. Problems were resolved and everyone's enthusiasm mounted.
8	Coordination Gone Awry	Comprehensive High School	English Vocational Assistant Principal	The first year that students collected information about their vocational specialties and prepared videotape presentations in English class was a success. Poor coordination between English and vocational teachers during the following year led to frustration and complaints to the assistant principal.
9	The Applied Approach Makes All the Difference	Comprehensive High School	Math Vocational	A team of teachers, perceived as leaders by their vocational and academic colleagues, was formed and sent to a national conference on integration. Upon returning, the team wrote applied curriculum activities that could be implemented by all teachers. When the activities were presented during staff development sessions, faculty members were enthusiastic.
10	Sharing with Parents	Comprehensive High School	Guidance Counselors Vocational & Academic Teachers	A special conference day when parents could meet with vocational and academic teams to discuss their children's futures was planned by the guidance counselors. Local newspapers, radio, and television helped promote the conference day which turned out to be an overwhelming success.
11	Teacher Cooperation Leads to Learning Enrichment	Comprehensive High School	Math, Science Vocational English Guidance	Vocational teachers share real-life examples of math use with at-risk students and have students write in the content area. These assignments led to opportunities for cooperative efforts among teachers, the most successful being a senior program for preparing career-related research papers.
12	Reinforcing Academics	Comprehensive High School	Guidance Counselors Auto Mechanics	A counselor explained to other counselors from the school district how an auto mechanics teacher emphasized the importance of doing well in academic classes. His students' discipline improved after they began to become more serious about classes, especially when he convinced them of the importance of math and reading for job success.

GROUP II				CURRICULUM STRATEGIES
CASE	TITLE	TYPE OF SCHOOL(S)	TEACHING AREAS	DESCRIPTION
13	The Turning Point	Vocational/ Technical Center	Engineering Architectural Drafting English	Students in the drafting class saw little point to their journal assignments; however, after a speaker from the business community said she wrote in her journal every day, the students took a greater interest in their journals. Students' motivation increased for other writing assignments in English classes as well.
14	Confusion Reigns	Comprehensive High School	English Vocational	English and vocational teachers worked together to implement a freshman career project. A reluctant English teacher complained about not being given extra planning time to coordinate the project. Procedures for completing the project were confusing to the teachers and they felt they needed a coordinator.
15	Was It Miscommunication or Inexperience?	Comprehensive High School	Electronics Physics	An electronics teacher and a physics teacher coordinated efforts so that instruction of electronics material in the physics class coincided with the introduction received in the electronics class. Unfortunately, the electronics teacher felt that the level of information in the physics class was too theoretical and that he preferred to teach the material himself.
16	Teaming To Develop a Textbook	Comprehensive High School	Math Electronics	A math teacher helped teach basic mathematical computations to an electrical class at the request of the teacher. One outcome of their working together was the development of a specialized textbook that helped students who otherwise may have failed.
17	Hands-On Experience Versus Class Attendance	Comprehensive High School	Broadcast Journalism	A broadcast journalism teacher developed a program for students to obtain hands-on experience taping and editing. Academic teachers were resentful that sometimes these students had to be excused from their classes to obtain this experience.
18	Should They Pull Them Out?	Vocational/ Technical Center	Occupational Child Care English Math	Students needing help with academic subjects were pulled out of the occupational child care class and missed important instruction. At the same time, the English and math courses were not coordinated to match the skills students needed for their vocational fields.
19	Making Math More Relevant	Comprehensive High School	Math Electronics	A math teacher taught math to electronics students so that they saw real applications for the math they feared. The math and electronics teachers felt the program was successful and wanted to continue it, but scheduling for the next school year may not allow it.

CASE	TITLE	TYPE OF SCHOOL(S)	TEACHING AREAS	DESCRIPTION
20	Time for Change	Comprehensive High School	Communication Technology English	An industrial arts teacher was skeptical of integration and the career project the students were doing. With time, he saw the relevance and the success of the project and was pleased with its results.
21	Building a Better Mouse Trap (Car)	Comprehensive High School	Physics Construction	The physics and construction students were grouped into teams to build a car based on principles learned and individual skills. The project was fun and educational but required more time and effort than the teachers had planned for. They did not make plans to team teach again.
22	The Business of Learning	Comprehensive High School	Marketing English Biology	At-risk students were selected to form their own business enterprise to develop and market a product. Teachers felt that if students could feel more a part of the school, they would be more committed to their work. The students were very successful and became excited about school.
23	Getting Back on Track	High School	English	Students who failed freshman English during the school year attended an intensive summer course. The students were excited and successful when the academic course was related to their vocational interests.
GROUP III				**INSTRUCTIONAL STRATEGIES**
24	The Student Does the Teaching	High School Vocational/ Technical Center	Applied Math Auto Mechanics	Without knowing practical uses of equipment, a math teacher tried to use the equipment to teach math concepts. The math teacher got help from a student and an auto mechanics teacher who was initially intimidated by the math teacher's book knowledge.
25	But, It Takes Time	Comprehensive High School	Business English	A business teacher had difficulty cooperating with an English teacher on integrating activities for her class. The business teacher felt that her class was disrupted by the integration and that she was making all of the concessions.
26	The Formula for Interest	Comprehensive High School	Math Computer Applications	A math teacher and a computer applications teacher realized they were teaching the same concepts. They decided to coordinate their efforts. The math teacher introduced concepts and the computer applications teacher reviewed the concepts.
27	Letter Writing in the Auto Mechanics Lab	Comprehensive High School	Auto Mechanics English	An auto mechanics teacher, after receiving help from an English teacher, used business letter writing to review a safety unit. The students worked together in groups and exchanged information among themselves. The exercise was successful but students did not feel confident submitting the letters in English class.

CASE	TITLE	TYPE OF SCHOOL(S)	TEACHING AREAS	DESCRIPTION
28	Mathematics in the Pre-Engineering Laboratory	Vocational/ Technical Center	Math Pre-Engineering	A math teacher taught pre-engineering students how to use technical math for a practical exercise they were finding difficult.
29	The Community Can Be a Valuable Resource	Comprehensive High School	English Business	English and business teachers worked together to have eleventh graders prepare research papers that dealt with their vocational interests. The teachers found that they needed cooperation from the business community for up-to-date information.
30	Diabetics in the Classroom	Comprehensive High School	Math Health Occupations	The math and health occupations teachers designed integrated activities to teach math students about diabetes and the use of math calculations for a diabetic. The students were excited and shared what they had learned with others.
31	Interviewing Skills	Comprehensive High School	Business Math	Business teachers who were trying to develop interviewing skills worked with math teachers to hold mock interviews with students. All involved were frustrated by the activity.
32	Teaching Writing Skills to Horticulture Students	Comprehensive High School	English Horticulture	An English teacher and a horticulture teacher worked together on an assignment requiring horticulture students to write a research paper for their English classes. The English teacher had mixed feelings about the success of the project. The papers often fell below his expectations.
33	A Science Teacher Learns About Computers	Comprehensive High School	Physics Computers	A physics teacher and computer teacher worked together to integrate computers into the physics classroom. The teacher was not afraid to let her students know that she didn't know what they were learning.
34	Anxiety in the Computer Laboratory	Comprehensive High School	English Computers	An English teacher was aided by a computer teacher in teaching students word processing in the computer lab. The English teacher moved from being anxious to presenting information effectively on her own because of the computer teacher's cooperation.
35	Don't Say Trigonometry	Comprehensive High School	Engineering Math	An engineering teacher worked with a math teacher in determining how to teach trigonometry to his students, with about half not having studied beyond basic algebra. Calculations concerning kite flying became a trigonometry lesson for these students.
36	Parasites in the Fish Tanks	Comprehensive High School	Agriculture Science	Agriculture and science students worked together on a project to identify and treat fish parasites. The students got to see practical applications for the science principles they had learned in the classroom.

GROUP IV				ADMINISTRATIVE PRACTICES AND PROCEDURES
CASE	TITLE	TYPE OF SCHOOL(S)	TEACHING AREAS	DESCRIPTION
37	What We Have Here Is a Communication Problem	Comprehensive High School	All areas	The principal and assistant principals at the high school spent time discussing and planning the integration of vocational and academic education without involving the entire faculty in the process.
38	If at First You Don't Succeed	Comprehensive High School	All areas	Teachers had difficulty with integration because of limited time and no team planning. The principal decided to hire teacher aids and provided common planning times for the teachers who were in teams.
39	Dealing with the Skeptics	Comprehensive High School	All areas	The principal wanted to integrate vocational and academic education to better meet the needs of the student population. Academic teachers were skeptical of her plan and feared that the school would become a vocational high school.
40	Promises Never Kept	Magnet School for Technical Occupations	Horticulture English Physics	Teachers were reorganized into cluster groups to work together on integration and were excited about the changes being made. They spent time preparing a curriculum book, and when nothing was done with it by the administration, the luster of the project wore off.
41	Team Teaching: What Made It All Possible?	Comprehensive High School	Auto Mechanics Physics	Two teachers were concerned about the concept of integration and the effects it would have on their individual classes. They were paired up for the possibility of integrating physics and automotive instruction. They received support from their principal and successfully team-taught an applied physics course.
42	When Are They Really Going to Involve the Faculty?	Vocational/ Technical Center	All areas	An assistant superintendent for vocational and adult education made plans for integration without involving the faculty in the planning. The teachers were resentful and the plan progressed unsuccessfully.
43	This Will Ruin Our School	Vocational/ Technical Center	All areas	The director of the Center initiated a program for integration. The teachers were grouped in technical clusters, and the director felt that the integration was progressing successfully. Just before her report to the Center's board, a teacher expressed concern and skepticism about integration and threatened to file a grievance.
44	Organizing for Teacher Cooperation	Magnet School for Technical Occupations	All areas	The integration process had been successful but one teacher expressed the concern that teachers need to work together on integration on a daily and weekly basis for added success, rather than only at the monthly scheduled meeting.

CASE	TITLE	TYPE OF SCHOOL(S)	TEACHING AREAS	DESCRIPTION
45	Is There a Leader in the House?	Comprehensive High School	English Vocational	A skeptical teacher was chosen to coordinate the cooperative effort. He was frustrated by varying degrees of cooperation among the teachers and by the fact that no supervisor was assigned to the project by the principal's office. The teachers felt shortchanged by the whole affair.
46	A Heart-to-Heart Talk	Comprehensive High School	All areas	A principal made a scheduling error that caused lack of coordination among teachers, embarrassed a new teacher, and cost the students a positive learning experience.